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The Games Gang reveal all the best cheats and passwords

GOTO CENTRE PAGES

3 GREAT CONTESTS

WIN the latest Amiga – and lots of other prizes

GOTO 9, 17 and 43

Pop Quiz

GOTO 26

Get your computer to mix you a witches' brew

GOTO 6

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REGULARS

Final Front Ear GOTO 8
Rom and Ram GOTO 11
Gadget Shop GOTO 14
Safe Scientist GOTO 18
How a Computer Works GOTO 20
Keyboard Kapers GOTO 27
Logo Lowdown GOTO 35

Noticeboard

I have discovered a bug in the Gingerbread roms program. I typed it in on my BBC Micro exactly as it is shown.

But I received the error message: *Mistake at line 260.* When I examined that line I discovered that the command IF had been left out.

The corrected line is:

```
IF r<1 THEN PRINT ;"Three
quarters";:RETURN
```

– Matthew Thompson (16), Kidlington, Oxford.

We're sorry the word was missed. The listings are all well checked before printing but we missed that one.

We're stepping up up our testing to ensure it doesn't happen again.

If you have any tips for other readers, send them in. If you have any questions about your computer or software just ask us. We'll try to answer them on the Noticeboard.

Let us know what you want to see in future issues. And if we use your letter or ideas we'll send you a *Let's Compute!* baseball hat!

Send your letters to *Let's Compute!* Europa House, Adlington Park, Macclesfield SK10 4NP. Remember to tell us your age.

The second issue of *Let's Compute!* was great. Even better than the first. And that's high praise indeed!

I like the electronic game in The Gadget Shop. We had one at our summer fair, and there's one at the Science Museum in London. I can do all three of them.

The pictures in Al's Gorithms are really sweet. It's amazing what you can do with circles.

The Back to the Future program is really useful. I always want to know what day things are on, whether I've got a piano lesson on my birthday and so on.

The program now does it for me. I don't need to look at the calendar any more.

And what about the football bit? It is probably interesting if you're interested in football. But I'm not.

Finally, I think the competitions are great. Let's have even more!

– Kathryn Price (12), Alfreton, Derbyshire.

Winners! Winners! Winners! Winners! Winners!

Hundreds of you wanted to personalise your computers with cute Computer Critters. But we only had four to give away and they're winging their way to the winners of the contest we printed in the August *Let's Compute!*

Congratulations to these lucky winners: Miriam (8) from Chigwell in Essex, Steaphnie Leack (11) from Lancaster, Jamie Radford (14) from Uplands near Swansea and Jason Cooke (10) from Bromsgrove.

Hard luck losers. But we've even more prizes to give away in this issue of *Let's Compute!* So see if you can win one of those.

Entries for the Alphabet Artist contest are still pouring in. But there's still time for you to send yours before November 30.

The picture of Churchill shown here is by Martin Pegg (13) from Derby. He's just one of this month's five lucky winners who'll be receiving a copy of Art Studio from Impact Software.

This month's other four winners are:

John Pearce (15) from Knaphill, Surrey – a Spitfire
Owen Williams (12), Halstead, Essex – a helicopter
Richard Gubbing (10), Congleton, Cheshire – Fat puss the cat
Gemma Hillman (7), Loughborough, Leics – a dog

Don't forget, there are lots more prizes to give away: A voucher worth £50 for the overall winner to spend as you wish and TWENTY more vouchers worth £5 each for the next 20 best.

Impact are also presenting £100 for the best picture received with a school name on the entry form. You'll find entry forms in the August and September issues.

Noticeboard

Many congratulations on what would appear to be an excellent computer magazine for children! It's full of ideas for learning about IT that can be easily transferred to classroom situations.

Would it be possible for us to photocopy some of the material for use in school? Perhaps we could provide you with some field research in return.

I was also wondering if you did any special promotions for schools. I feel that your magazine is one that we could promote in school to the benefit of our own pupils.

– Arnold Marchant, Boldmere Middle School

We've received many letters like this from schools wanting to boost their funds. As always, *Let's Compute!* does what its readers want.

So, we'll give £1 for each subscription a school gets for *Let's Compute!* For more details, write to Pete Davidson.

All the material in *Let's Compute!* is copyright and must not be reproduced without written permission. Any school obtaining more than 10 subscriptions will automatically be given this permission.

Thanks for the offer of field research. We value feedback from all sources. It's only by hearing what children and schools want to see that we can give you exactly what you want.

I have just had an idea for your comic: A high score table for games would be great!

You could ask readers to send in their name, address, computer and the high scores they're reached . Then you could print them. It would give *Let's Compute!* readers something to compete against.

– James Hollis (13), Wakefield, W.Yorks

We'll be printing our first high score table next month. If you would like to see your name on it, just fill in and send us the coupon below. Post it to High Scores, *Let's Compute!* Europa house, Adlington Park, Macclesfield SK10 4NP.

We'll print the best. By the way, James. You didn't give us your full address. Remember that ALL writers of letters on the noticeboard receive a free baseball hat. Your hat's here waiting: Just send us your address.

High score challenge

Name .....

Address .....

..... Age .....

Computer .....

Game ..... Score .....

Game ..... Score .....

Game ..... Score .....

Game ..... Score .....

I am a *Let's Compute!* Club member and want to take part in the competitions. But I don't want to cut up my copy of the comic.

Can I photocopy or draw the entry form myself?

I find *Let's Compute!* easy to understand. There's only one word for it – BRILLIANT!

– Laura Corney (13), Greenock, Scotland

We don't mind how your entries are sent. But try to keep them about the same size as the ones we print. And make sure you tell us everything that's asked for on the original coupon.

If you want to enter more than one competition you can send them all in one envelope.

Just address it to *Let's Compute!* Competitions, Europa House, Adlington Park, Macclesfield, SK10 4NP.

I have just received my member's pack. I am very pleased with it, especially the software.

However, I looked at the ruler and decided to memorise which was Ram and which was Rom. On the ruler Rom wears the glasses, but in the first issue of *Let's Compute!* Ram has the spectacles.

Could you please tell me which is which?

– Simon Marwood (12), Richmond, North Yorks.

Ram is the clever one with the glasses. Rom is rather thick, and always hungry. The cartoons are drawn by ace cartoonist Mike Goldberg and are therefore always right in the magazine. But when they were put on the ruler, someone got it wrong.

Mike sent a special cartoon to the person who made the mistake. We're printing it here to help any readers who are at all confused between Rom and Ram.

Witches' Brew

The party season has arrived. And what better way to make a halloween party – or any other – go with a fizz than to prepare an unusual cocktail of drinks?

Here's a program that gives you a few ideas of what you could mix with what.

But once you've created your tasty concoction, what do you call it?

The program itself comes to your rescue. Along with the list of suggested ingredients you also get a name.

As it's one made up by your computer it may look strange. And you may have trouble saying it. So be warned: With some of them you may tie your tongue in knots trying!

Now type it in – and have fun!

Is YOUR machine here?

```
 10 REM The Witches' Brew
 20 REM (C) Let's Compute!
 30 DEF FNr(n)=RND(n)
 40 LET w$="aeiou"
 50 LET v$=""
 60 LET c$="bcdfghjklmpqrstvwxyzn"
 70 DIM d$(3,50):DIM x(3)
 80 FOR A=1 TO 3:LET M=0
 90 LET M=M+1
100 READ d$(A,M)
110 IF d$(A,M)<>"" THEN GOTO 90
120 LET x(A)=M-1:NEXT A
130 LET DUMMY = RND(-TIME)
140 CLS
150 PRINT "WITCHES' BREW"
160 PRINT
170 PRINT "How to make a ";
180 GOSUB 400
190 PRINT
200 FOR C=1 TO 3
210 GOSUB 270
220 NEXT C
230 PRINT
240 PRINT "Press a key for another dri
nk"
250 LET A% = GET
260 GOTO 140
270 REM SORT OUT WORDS
280 LET LD=0
290 LET T=FNr(3)
300 LET R=x(C)-LD
310 LET D=ABS(FNr(R+2)-FNr(R))+1+LD
320 IF D>x(C) THEN GOTO 390
330 IF C=3 THEN PRINT "and some ";:GOT
O 370
340 PRINT " ";T;" Measure";
350 IF T>1 THEN PRINT "s of ";
360 IF T=1 THEN PRINT "  of ";
370 PRINT d$(C,D)
380 LET LD=D:GOTO 290
390 RETURN
400 REM FIND AND PRINT NAME
410 LET R=FNr(21)
420 PRINT CHR$(ASC(MID$(c$,R,1))-32);
430 IF R=12 THEN LET v$="u":PRINT v$;
440 IF R=15 THEN IF FNr(5)=1 THEN PRIN
T "h";
450 GOSUB 580
460 PRINT v$;
470 IF FNr(15)<2 THEN GOTO 450
480 LET R=FNr(21):PRINT MID$(c$,R,1);
490 IF FNr(15)=1 THEN PRINT MID$(c$,R,
1);
500 IF R=12 THEN LET v$="u":PRINT v$;
510 IF R=1 THEN IF FNr(20)=1 THEN PRIN
T "b";
520 IF R=2 THEN IF FNr(2)=1 THEN PRINT
 "k";
530 IF R=15 THEN IF FNr(9)=1 THEN PRIN
T "h";
540 IF R<>12 THEN IF FNr(15)=1 THEN PR
INT "r";
550 IF FNr(5)<4 THEN GOTO 450
560 IF FNr(9)<5 THEN GOSUB 580:PRINT v
$;:IF FNr(15)=1 THEN PRINT "r";
570 PRINT:RETURN
580 REM FIND A VOWEL
590 LET x$=v$
600 LET P=FNr(5)
610 LET v$=MID$(w$,P,1)
620 IF v$=x$ THEN GOTO 600
630 RETURN
640 REM Soft Drinks
650 DATA "Lemon juice","Apple juice","
Pineapple juice","Tomato juice"
660 DATA "Apricot juice","Orange juice
","Mixed fruit juice","Lime juice"
670 DATA "Vimto cordial","Pear juice",""
680 REM Fizzy drinks
690 DATA "Coke","Vimto","7 Up","Lemona
de","Bitter Lemon","Tonic water"
700 DATA "Ginger ale","Soda water",""
710 REM Floaters
720 DATA "orange peel","ice cubes","cl
oves","lemon peel","lime peel"
730 DATA "cherries","crushed ice","app
le slices","raisins","dried apricots"
740 DATA "dried peaches","fresh pineap
ple cubes","orange slices"
750 DATA ""
```

BBCMicro/Archimedes/Electron

The listing works as shown

Amstrad CPC

Change the following lines:

```
 30 DEF FNr(n)=INT(RND*n+1)
130 RANDOMIZE TIME
250 WHILE INKEY$="":WEND
```

C64/128

Enter the program in capitals.
Change the following lines:

```
 30 DEF FNR(N)=INT(RND(0)*N+1)
140 PRINT CHR$(147)
250 GET A$:IFA$="" THEN GOTO 250
420 PRINT MID$(C$,R,1)
```

PC (GW-Basic)

Change the following lines:

```
 30 DEF FNr(n)=INT(RND*n+1)
130 RANDOMIZE TIMER
250 WHILE INKEY$="":WEND
```

Spectrum

Use 48k mode.
Change the following lines:

```
30 DEF FNr(n)=INT(RND*n+1)
70 DIM d$(3,50,22): DIM x(3): DIM s$(22)
110 IF d$(A,M)<>""s$ THEN GOTO 90
130 RANDOMIZE
250 PAUSE 0
310 LET D=ABS (FN r(R+2)-FN r(R))+1+LD
420 PRINT CHR$ (CODE (c$(R))-32);
490 IF FN r(15)=1 THEN PRINT c$(R);
610 LET v$=w$(P)
```

ST (Stos) / Amiga (Amos)

Change the following lines:

```
 30 MODE0:HIDE
130 LET a=RND(TIMER)
250 WAIT KEY
290 LET t=RND(2)+1
310 LET D=ABS(RND(R+2)-RND(R))+1+LD
600 LET p=RND(4)+1
```

***AMOS: Use** `CLS` **instead of** `MODE0`*

FIRST THE LEFT EAR, THEN THE RIGHT EAR, AND NOW THE FINAL FRONT-EAR

LAST MONTH, THE "USELESS-S-ENTERPRISE-ALLOWANCE" CREW WERE SEPARATED WHEN A TERRIFIC EXPLOSION SNAPPED THE BRIDGE FROM THE ENGINES...

I TRIED TO WARN YOU CAPTAIN!

NEVER MIND Mr. SHOCK. AT LEAST MY MEGA-BURGER TASTED BETTER WITH SAUCE ON IT!

WE'LL NEED SOME MORE ROOFING-FELT THOUGH...

30

-AND SO THE INTREPID CREW PARK AT THE ALWAYS HANDY NEARBY ENGLISH SPEAKING PLANET...

SMACK!

RIGH! COMPUTER- GIVE ME VISUALS!

OH NO!! THE COMPUTERS HAD IT!

DIM-A-FIX-IT

ERROR

RIGHT.- WE'LL HAVE TO BEAM DOWN TO THE PLANET AND BUY ANOTHER.

TRANSPORTA

SAUNA

SQUASH

"MY MUM'S SHOPPING BAG"

SERIOUS

WE'LL NEED IT TO GET BACK TO THE OTHER HALF OF THE SHIP!

SHOWER

PERM

SUN LAMP

PULL

POLITE

TRANSPORTA

DOWN ON THE PLANET

HEY, A RUBBER PLANET!

FLAIL

"MY MUM'S OH, FORGOT IT!"

BOUNCE

GOT ANY MICROS MISTER?

NO - CLEAR OFF THIS IS A KIDS' BOUNCING CASTLE!

SHOP ARE OVER THERE!

NEW! BENT DISCS!

BUY ONE NOW AND BUY TWO LATER

THE HAMPTON ST. MOOR MEMORY

IS IT A DISC? OR IS IT A CASSETTE?

DON'T ASK FOR CA

O.K. WE'LL TAKE THE ONE WITH THE RUBBER KEYS!

OH NO

A WISE CHOICE SIR- I'LL WRAP IT UP.

EXTRA

ACE!

MICRO SHOP

OPEN

SPECTRUM

NO! NO!

JUKEBOOK

ONLY 50,000 LEFT

VICTOR THIRTY

BACK ON BOARD

STAR CHART

IS THAT THING READY YET - I'M STARVING AND WE'RE LIGHT-YEARS FROM A DUCKMONALDS RESTAURANT?!

IT'S THE KEYS CAPTAIN - THEY'RE MELTING TOGETHER

SEATING CAPACITY 25

MAINS ONLY

DONE!...

WELL DONE MR. SHOCK!

...BUT I THINK THERE'S A SMALL PROBLEM..

FULL WARPED SPEED ENSIGN...

..ER, DIM?!

LET'S FIND THE OTHER HALF OF THIS SHIP - AFTER WE'VE EATEN OF COURSE!

BUT!!-

BOUNCE

ZIP

BOING GGG

TELL ME ABOUT THOSE RUBBER KEYS MR SHOCK...

WILL THE CREW REACH THE OTHER HALF OF THE SHIP - BOUNCE BACK NEXT MONTH!

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PLUS

- ***A video to teach you how to set up your new Amiga, use the programs and what to do next.***

The monitor in the picture is not included in the prize. The computer will work with an ordinary television

WHAT TO DO

We are looking for the person who can make the most words out of the letters in these two:

COMMODORE AMIGA

Write down all the words you find on a separate piece of paper. Then attach it to the entry form and send it to *Let's Compute!* before October 31.

Worth £599

AMIGA CONTEST ENTRY FORM

I found ..... words

Name .....

Address .....

..... Postcode .....

Tel ..... Age .....

My present computer is a : .....

Now send this to: Commodore Competition, Let's Compute! Europa House, Adlington Park, Macclesfield SK10 4NP.

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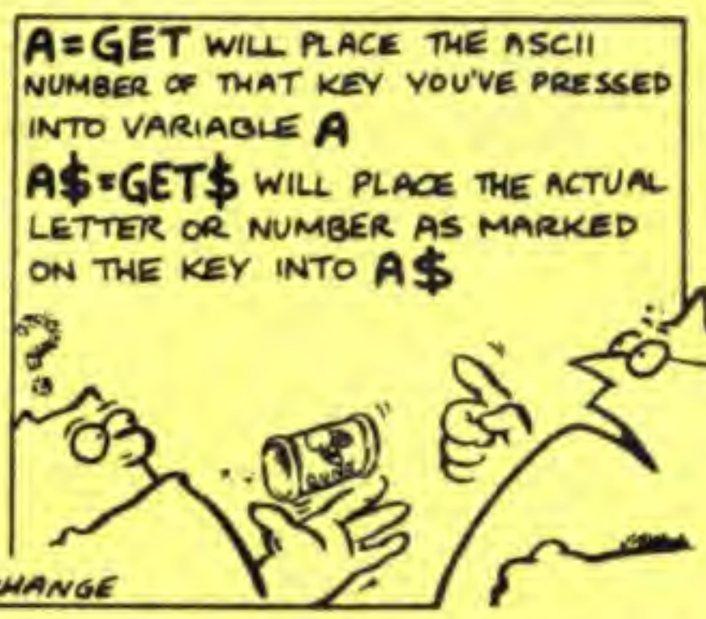
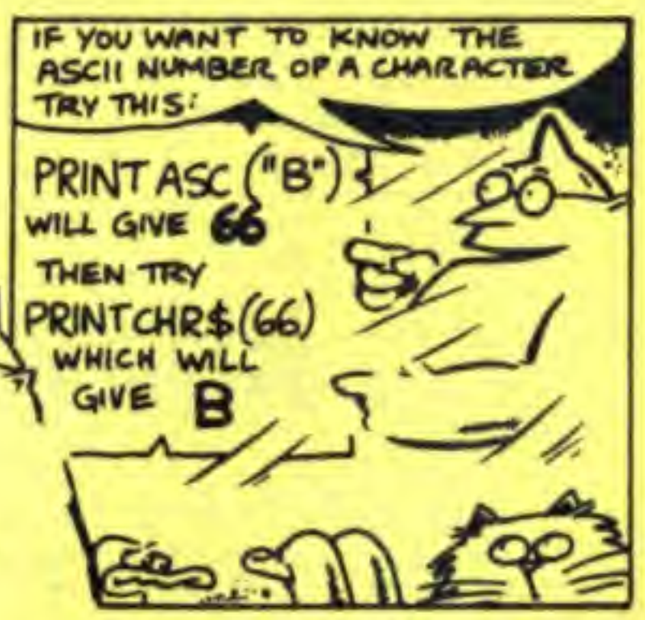
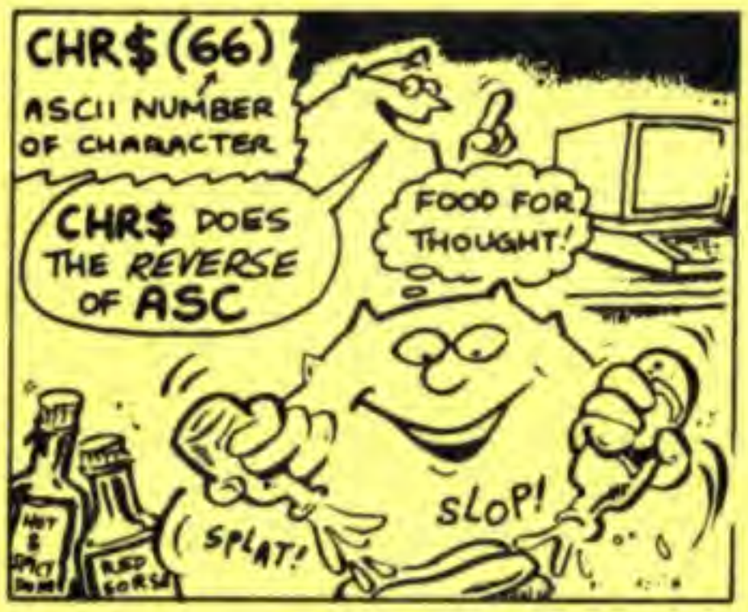
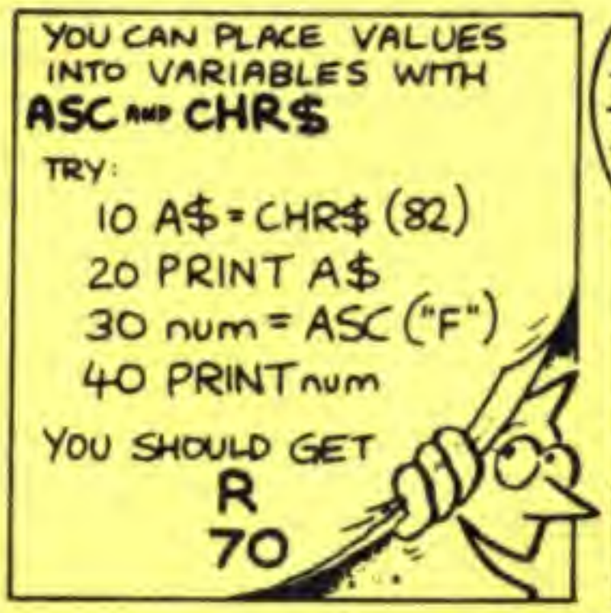
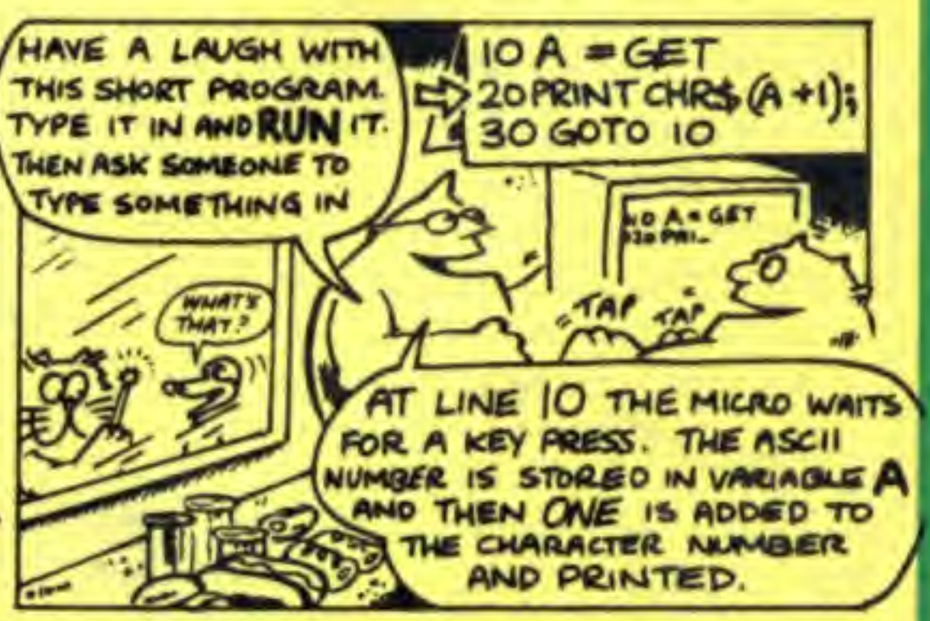
BBC BASIC WITH ROM & RAM

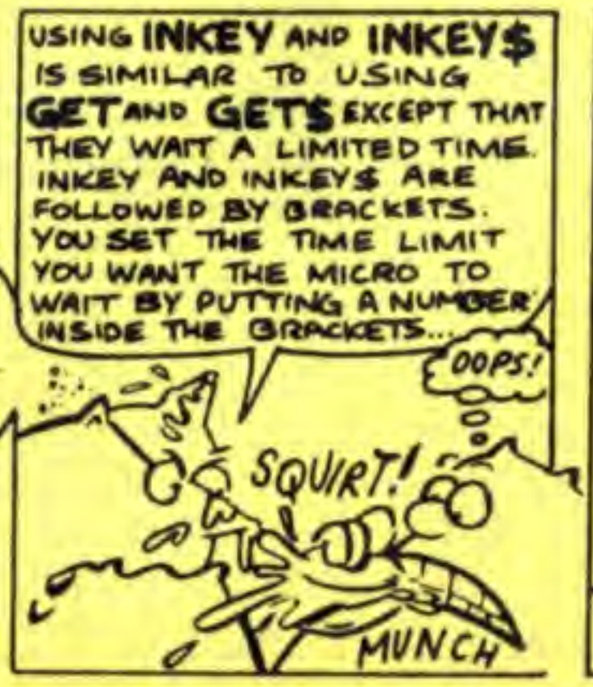












TRY THIS EXAMPLE
10 CLS
20 A = INKEY(50)
30 PRINT "ROM ";
40 A = INKEY(50)
50 PRINT "EATS ";
60 A = INKEY(50)
70 PRINT "LOADS"
80 A = INKEY(50)
90 GOTO 10

WIPE

CHORTLE!

NOW THEN, TYPE IN **DELETE 20,80**

WHAT WAS THAT?

PROD!

PLUKE!

TAP

SWING

TO REMOVE PARTS OF A PROGRAM USE **DELETE** FOLLOWED BY A LINE NUMBER, A COMMA AND ANOTHER LINE NUMBER
TYPING IN **DELETE 20,80** AND THEN PRESSING RETURN WILL REMOVE ALL LINES BETWEEN 20 AND 80 INCLUDING 20 AND 80

?

CHUCK

AO

WHAT A GANNET!

THAT WILL LEAVE LINES 10 AND 90
HERE'S ANOTHER NEW COMMAND FOR YOU ROM. IT'S CALLED **RND** WHICH IS AN ABBREVIATION OF RANDOM

PINCH

TWIRL

?

WHAT'S WITH THE TWIRL?!

ADD LINES

20 A=GET
30 PRINT RND(6)
80 A = GET

NOW **RUN** IT

TOSS

HEY, IT'S A DICE GAME!

SURELY NOT A SIGN OF INTELLIGENCE?

YES **RND** WILL RANDOMLY SELECT A WHOLE NUMBER BETWEEN ONE AND THE NUMBER YOU PLACE IN THE BRACKETS

RND(6)

PRINT RND(1) WILL SELECT A FRACTION BETWEEN 0 AND 1

OUTSIDE

ADD LINE 40PRINT RND(6) FOR TWO DICE ROM

RIFLE

TYPE **NEW**. NOW, TRY THIS:

```
10 PRINT "WHAT IS ";RND(10);
20 PRINT "TIMES ";RND(10)
30 PRINT "YOU HAVE 10 SECS TO ANSWER"
40 A = INKEY(1000)
50 PRINT "TIME'S UP!"
```

DON'T TYPE IN YOUR ANSWER— WRITE IT DOWN ON PAPER

BETTER, LET A VARIABLE HOLD THE VALUE OF THE SELECTED RANDOM NUMBER

```
10 A = RND(10)
20 B = RND(10)
30 PRINT "WHAT IS ";A;" x ";B
40 PRINT "YOU HAVE 10 SECS TO ANSWER"
50 A = INKEY(1000)
60 PRINT "DID YOU GET ";A*B;"?"
```

ONE ONE IS ONE, TWO ONES ARE... ER.. SEVEN?

YOU SHOULD GET A LOAD OF NONSENSE WITH THIS EXAMPLE. TYPE **NEW** AND TYPE IN:

```
10 PRINT CHR$(RND(26)+64);
20 GOTO 10
```

TAP

NOW TYPE IN **RUN** AND PRESS RETURN

EXPLANATION

CHR$ (RND (26) +64)

SELECT A RANDOM NUMBER BETWEEN 1 AND 26 AND ADD 64 TO IT. THIS WILL GIVE RANDOM NUMBERS BETWEEN 65 AND 90 – THE ASCII NUMBERS OF THE ALPHABET A TO Z

IS THAT THE LOT?

YUP!

YOU CAN USE THIS IN ANOTHER *FUN* PROGRAM
TYPE **NEW**. PRESS RETURN. NOW TYPE IN:

```
10 G = GET
20 CLS
30 PRINT "FIND LETTER ";
40 PRINT CHR$(RND(26)+64)
50 A$ = INKEY$(200)
60 GOTO 20
```

COR! GOT TO BE QUICK

ZIP

WHOOSH

I'D LIKE TO KEEP SOME OF THESE PROGRAMS RAM. CAN IT BE DONE?- OR WHAT?

WHY YES OH SIMPLE ONE!

YOU CAN **SAVE** A PROGRAM ONTO CASSETTE TAPE, OR, IF YOU'RE LUCKY, ONTO A FLOPPY DISC. WE'VE GOT TAPES ROM.

HEY, THESE REALLY ARE FLOPPY!

BREAK!

PRESS ESCAPE, NOW, PICK A NAME TO CALL YOUR PROGRAM. LET'S CALL THIS **DICE**. TO SAVE IT, TYPE **SAVE** "DICE". THEN PRESS RETURN.

)SAVE"DICE"

ON SCREEN

RECORD then RETURN

IT'LL SAY THIS

VACANT

NOTE:
SET YOUR TAPE RECORDER TO 000 IF IT'S GOT A COUNTER AND PRESS PLAY/RECORD. THEN PRESS RETURN ON YOUR MICRO

WHEN YOU WANT THE PROGRAM BACK LATER ON, YOU SIMPLY **LOAD** IT IN. TYPE **NEW**. REWIND YOUR TAPE TO THE BEGINNING OF THE PROGRAM. TYPE **LOAD"DICE"** AND PRESS RETURN

MUNCH! CHOMP! SLOBBER! BELCH! SLURP!

YOU MAY CALL A PROGRAM WHATEVER YOU LIKE WITH A MAXIMUM OF **10** LETTERS FOR TAPE SAVING, AND A MAXIMUM OF **7** LETTERS FOR DISCS.

Examples:
SAVE "ROMBO"
SAVE "ACEONE"
SAVE "DICE2"
SAVE "RUBBISH"
SAVE "THEWHALE"
SAVE "MONEY"

WRONG! YOU CAN'T HAVE SPACES
↳SAVE"THE WHALE"

RIGHT! ALL DONE THIS MONTH ROM. JUST REMEMBER

RND(28)
CHR$(66)
ASC("R")
GET$
INKEY$
DELETE
LOAD
SAVE

AT LAST!

I'M OFF DOWN THE PRECINCT— THERE'S A NEW 'KYLIE MANURE' SINGLE OUT... WANT ANYTHING BEFORE I GO?

EMPTY!

YEH! FOOD!

NOT AGAIN!

WELL, YOU CAN ALWAYS EAT THESE LEFT OVER SPEECH BUBBLES!

-VAROOSE BOOK- SPEECH SURPLUS

NOW BEFORE

YES!

I'M HUNGRY

COME ON, IT'S EASY ROM!

OF COURSE, THIS IS ONE OF MINE!

MAG

NEXT MONTH **IF** ROM IS GREEDY **THEN** RAM IS COOL — OR **ELSE**!

FOOLED 'IM AGAIN!

WELL, IT'S NOT DIFFICULT!

HAR! ANOTHER FREE FEAST!

NO ORANGE SAUCE THOUGH!

The Gadget Shop

STOP THIEF !!!

Gadget Shop proprietor Mike Cook shows how his computer is linked to the outside world – to keep out unwanted visitors

There are lots of ways of making burglar alarms. In the Gadget Shop this month we'll see how to turn your computer into an electronic watchdog.

And you needn't stop at burglar alarms. The switches we're going to use can just as easily perform other jobs. Such as keeping a check on the position of a model train. Or as the keyboard of a musical instrument.

The link to your computer is through a connector strip. Remember we made one at the start of this series. Let's see what else we will need.

Using this type of connector our computer can only detect if something is switched on or off. What we have to do is to get our intruder to do this with some form of invisible switch.

A reed switch is ideal. It uses two contacts sealed in a glass envelope. When we bring a magnet close to it the contacts move together and complete the circuit.

All we need do is mount a magnet on a door and a reed switch on the door frame. These must be placed so that when the door is closed the magnet is next to the switch. The magnet pulls the two contacts together and the switch is ON.

When the door is opened the magnet moves away and the reed switch opens. Our computer will spot this happening and raise the alarm.

If you are connecting your alarm to the User Port of an Acorn machine you have eight inputs and can monitor up to eight doors or windows at the same time. If you connect it to the joystick port of another micro you have five inputs.

In fact you can alarm any number of doors or windows by just chaining the switches together. In this way you'll know when one is open. But not which one.

Other uses for the switches

If you want to monitor the position of a model train put the reed switch near the track and the magnet on the train. The switch will close as the train passes over it.

Or you can make a simple musical instrument by mounting eight switches in a row. If you connect them to your micro and write a short program you can play tunes by waving a magnet over the switches.

There are lots more uses for this type of switch. For example you could design an electronic game.

Let us know if you make anything unusual from these switches – there will be a prize for the brightest idea.

The program and computer terms used in this article relate to Acorn micros. Readers with an Amstrad CPC, Commodore 64/128, Spectrum, Atari ST or Amiga who order a Gadget Shop pack will be sent complete instructions appropriate to their machines.

IN THE SHOP SOON: UNIQUE ELECTRONIC GAMES

Which switch do you need?

On offer this month are three different types of reed switch and magnet. They're all mounted in white PVC cases and fixed in place with screws or nails.

The surface mounting set can be used for windows as well as doors. The two recessed sets – one large and one small – are best for doors. The diagram shows how to wire them up and the photographs show them fitted

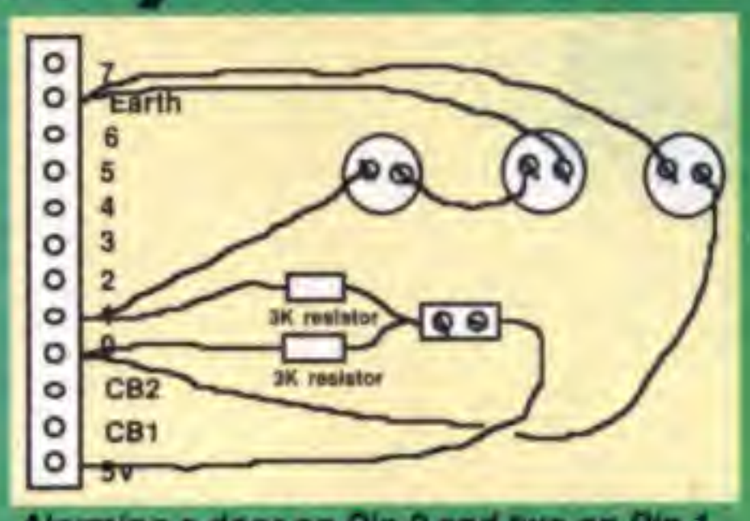
You can connect several different switches to one computer. Just copy the wiring diagram for each one.

Any unused inputs should be wired directly to the earth connection .

The listing given is for a BBC Micro. It is a simple program to monitor the switches and raise the alarm. You can use it as a basis for your own routines

Remember to make the modifications shown below if you are using an Electron or Archimedes.

Modifications for the Spectrum, CPC, Atari ST and Amiga are supplied with Gadget Shop Pack 2 – remember to state which computer you are using.



Alarming a door on Pin 0 and two on Pin 1

```
   10 MODE 7
   20 PRINT"The Gadget Shop Intruder Ala
rm"
   30 REPEAT
   40 C%=1
   50 PRINT TAB(0,4)
   60 A%=?&FE60
   70 FOR B%=0 TO 7
   80 IF (C% AND A%)=0 THEN PRINT"Locati
on ";B%;" is safe";SPC(10) ELSE PRINT"In
truder at location ";B%
   90 C%=C%*2
  100 NEXT B%
  110 IF A%<>0 THEN SOUND 1,-15,20,1:SOU
ND 1,-15,100,1
  120 UNTIL FALSE
```

BBC listing – see text for other computers

WARNING

Keep the magnets in the contact sets away from your discs. Magnetic fields can damage programs stored on them.

The three types of contact you can get from The Gadget Shop

IS THIS YOUR COMPUTER?

BBC Micro: *Use the program above.*

Archimedes and BBC A3000: You need an i/o podule. The program also needs to be changed.

Replace Line 60 with:

```
SYS "OS Byte",150,&60 TO ,,A%
```

Note that the two commas after the TO are essential.

Electron: You need a Plus One and User Port expansion – available from Pres (0276 72046). The game and program work as they are described above except that the memory location which is accessed by the User Port is &FCB0. So wherever you see &FE60 in the program you use &FCB0

Spectrum: You need an Interface 1 and the gadget connects to the joystick port*.

Amstrad CPC, Commodore 64/128, Amiga and ST: The gadget connects to the joystick port*.

** The full assembly instructions are in Gadget Shop Pack 2. The short Basic routine to operate the gadget will be supplied when you order it.*

NEXT MONTH

Make a gadget that tests how good you are at shaking a sauce bottle!

Why ever should you want to do that?

Well it could turn out to be a super electronic game!

Find out what it's all about in *Let's Compute!* next month.

ORDER FORM

Pack 2 – Reed switch sets

This contains all the bits you need to make your burglar alarm except for the connector cable. This is still available, and you can also use this order form to get one.

- ☐ Surface mounting reed switch plus resistor £2.60
- ☐ Recessed round type plus resistor £2.70
- ☐ Recessed square type plus resistor £2.60

You'll also need Pack 1 – the User Port connector cable:

- ☐ 20 way IDC plug, length of 20 way ribbon cable, 12 way chock block, cardboard base, 2 foam sticky pads PLUS 2 spare connectors and a resistor £1.99
- ☐ As above but with IDC plug ready connected ...£2.49
- ☐ As above but with connector for Master Compact in place of IDC plug ... £3.99
- ☐ As above but with connector for joystick port of Spectrum, Amstrad CPC ,Commodore 64/128, ST or Amiga in place of IDC plug. Basic program and instructions will also be supplied ... £3.99

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THE PROGRAM DOCTOR

There's always a better way of doing things, and here's another program just waiting to be operated on. Our resident micro medic diagnoses several shortfalls.

Remember all those games programs where, having lost all your lives all too quickly, the micro offers you a chance to play the game again? Well, that's what the program at the top of the page does. It prints out a simple message until you press N to finish.

Recognise the standard question:

Do you want to finish?(Y/N)

Actually all that happens is that line 40 tests wether Y was pressed. If it wasn't it RUNs the program again. If you pressed any other key - including a small y - the program ends.

But we can do a much better job. The second program shows how.

Here are improvements that have been made:

- **You should always test for lower case letters as well as capitals - y as well as Y. That's what the OR is doing in the new Line 40.**

- **It's also polite to let the user know that the program has ended. So Line 50 is there to round things off.**

Those are the programming changes. But you might notice something else - put in to make the program easier to read.

It now starts with two lines of REMs. These don't affect the way it runs, but they act as a useful signpost. They tell you things like which version of the program it is and so on. Still, things could be even better. At the moment, any key except Y or y will repeat the program, despite the fact we've asked for a yes or no answer (Y/N).

There is one way round this. Just add another IF ... THEN. Put in the following line and you've got a much more friendly program:

```
45 IF k$<>"N" OR k$<>"n" THEN GOTO 30
```

All right, the main part of the program does nothing except print a bit of text. But the point is that WHATEVER someone types it is dealt with properly now.

The program caters for every input so there can be no freak happenings when someone presses X, say. And that's what makes a more polished job.

These routines will work - with the small changes listed - on most home micros. But there are more elegant ways of doing the same thing.

The snag is that you need to use different commands for different micros.

For example, on the BBC Micro you can use the command INSTR as part of your check for which letter was pressed.

On Page 9 of the August issue of *Let's Compute!* the green part of the listing shows this.

If you can write a super sophisticated bit of program to check for a Y/N reply on your micro, let us see it.

We'll pin the best to the Noticeboard and send the author a baseball cap.

This is the original program:

```
10 PRINT "This is all the program does."
20 PRINT "Do you want to finish?(Y/N)"
30 k$=GET$
40 IF k$<>"Y" THEN RUN
```

How the Doc altered it:

```
 1 REM ### Program Doctor ###
 2 REM ### Version Two ###
10 PRINT "This is all the program does."
20 PRINT "Do you want to finish?(Y/N)"
30 k$=GET$
40 IF k$<>"Y" OR k$<>"y" THEN RUN
50 PRINT "Goodbye then"
```

IS YOUR MACHINE HERE?

Electron/BBC/Archimedes

The programs work as shown

CPC/PC (GW-Basic)

Replace `k$=GET$` *with:*

```
K$="":WHILE  K$="":K$=INKEY$:WEND
```

Commodore 64/128

Enter the program in capitals
Replace `k$=GET$` *with:*

```
GET K$:IF K$="" THEN GOTO 30
```

Spectrum

Select 48k mode
Replace `k$=GET$` *with:*

```
K$=INKEY$:IF K$="" THEN GOTO 30
```

Amiga and Atari ST

Use Amos or Stos
Replace `k$=GET$` *with* `k$=INPUT(1)`

Do you think YOU'VE written a program that can't be improved? Then send it along to the Program Doctor. He LOVES a challenge!

Here's a whole load of presents dropping in!

Software giants US Gold and Ocean have got together this month to offer a deluge of goodies. And they're ONLY for readers of Let's Compute!

There are 185 prizes to be won in this great prize bonanza:

- Pens ★
- Badges ★
- T Shirts ★
- Balloons ★
- Keyholders ★
- Baseball caps ★

PLUS, for those winners who have a CPC, C64, Atari ST, Amiga or Spectrum, there are 10 copies of Ocean's superb Midnight Resistance

Questions

1 **Kylie first appeared in which TV soap?**
- a Home and Away
- b The Young Doctors
- c Neighbours

2 **Which country saw the first kites?**
- a China
- b USA
- c France

3 **From which tree do we get conkers?**
- a Horse Chestnut
- b Oak
- c Yew

4 **Which building did Guy Fawks try to blow up?**
- a Buckingham Palace
- b The Houses of Parliament
- c 10 Downing Street

ENTRY FORM

My answers 1 ☐ 2 ☐ 3 ☐ 4 ☐

Name _____

Address _____

_____

_____

Postcode _____ Age _____

My computer is a _____

Send to

Bonanza Competition, Let's Compute!, Europa House, Adlington Park, Macclesfield SK10 4NP

JACK IT UP!

The Safe Scientist starts piling on the pressure

This month's program is all about the scientific way of using pressure to do an everyday job. The program examines how the kind of jack used in garages for lifting up cars works.

It's really just a couple of cylinders joined together by a narrow pipe.

Each cylinder has a well-fitting piston inside it and the whole thing is filled with fluid – usually oil. So if you push down on one piston the oil passes the pressure produced on to the other cylinder, which moves up .

The clever part of the whole arrangement is that you can lift big weights easily if you choose the right size for your cylinders.

In the program you can change the size of either cylinder and see what happens. You can also alter the weight of the car you lift – scientifically known as the load – and how hard you push – the effort.

You may notice that units aren't mentioned in the program. They could be anything but, if you prefer, just think that lengths are in centimetres and forces and weights are in newtons.

The program works well, but has been kept as short as posible. If you are a programmer you could enhance it yourself.

For example, there's a procedure called PROCtap that checks for you pressing the spacebar. It was given that name because it was going to draw a tap in the pipe between the two cylinders – the tap would open when the spacebar was pressed.

PROCtap was shortened to reduce the length of the listing, but you could write your own.

You could also give the pipe a more unusual shape – machines like this will work even if knots are tied in the pipes. Also sound could be added.

Alter the program to suit yourself and use it in any way you like.

Just remember one thing. Science is meant to be fun, so start experimenting.

```
  10 REM The pressure machine
  20 REM By the Safe Scientist
  30 REM (c) Let's Compute!
  40 MODE6:VDU19,0,4;0;:PROCinstruct
  50 *FX16,0
  60 @%=&02020A:PROCsetup:REPEAT
  70 PROCsetup:REPEAT:MODE6
  80 MODE6:VDU23;8202;0;0;0;0;
  90 lh%=500:eh%=500:PROCaltervars
 100 PROCaltervars:MODE1
 110 MODE1:VDU23;8202;0;0;0;0;
 120 PROCdrawpress:PROCload(1)
 130 PROCtap:PROCworkout:UNTIL0:END
 140 DEFPROCsetup
 150 ll%=1000:el%=500:lll%=200:elI%=100
 160 lh%=500:eh%=500
 170 VDU23,224,3,4,8,63,127,255,255,48
 180 VDU23,225,240,136,132,254,127,127,
255,12
 190 car$=CHR$224+CHR$225
 200 VDU23,226,0,0,0,0,24,24,24,24
 210 VDU23,227,24,24,24,24,255,126,60,2
4
 220 ar$=CHR$226+CHR$8+CHR$10+CHR$227
 230 DEFPROCdrawpress:GCOL0,1
 240 MOVE200,200:DRAW1000,200
 250 MOVE200,200:DRAW200,700
 260 MOVE1000,200:DRAW1000,700
 270 MOVE200+ll%,300:DRAW1000-el%,300
 280 MOVE200+ll%,300:DRAW200+ll%,700
 290 MOVE1000-el%,300:DRAW1000-el%,700
 300 GCOL0,2
 310 MOVE204,lh%:DRAW196+ll%,lh%
 320 MOVE1004-el%,500:DRAW996,500
 330 ENDPROC
 340 DEFPROCload(c%)
 350 GCOL0,c%:VDU5
 360 MOVE168+ll%/2,lh%+36:PRINTcar$
 370 MOVE984-el%/2,eh%+76:PRINTar$
 380 VDU4:ENDPROC
 390 DEFPROCtap
 400 PRINTTAB(4,30);"Press Space to see
 what happens"
 410 REPEATUNTILINKEY-99
 420 PRINTTAB(4,30);SPC(31)
 430 ENDPROC
 440 DEFPROCworkout
 450 *FX15,0
 460 la=PI*((ll%/2)^2:ea=PI*(el%/2)^2
 470 lp=l%/la:ep=e%/ea:st=lp-ep
 480 IF st<0.0001 AND st>-0.0001 st=0
 490 IFst>0 M%=-1 ELSE IF st=0 M%=0 ELS
E M%=1
 500 em=la/ea*M%
 510 PRINTTAB(4,1)"LOAD"TAB(30,1)"EFFOR
```

```
T"
  520 PRINTTAB(17,3)"WEIGHT"TAB(12,5)"PI
STON DIAMETER"TAB(14,7)"PISTON AREA"
  530 PRINTTAB(4,3);lI%TAB(30,3);eI%
  540 PRINTTAB(4,5);lI%TAB(30,5);eI%
  550 PRINTTAB(4,7);la TAB(30,7);ea
  560 REPEAT:PROCload(0)
  570 lh%=lh%+M%:eh%=eh%-em
  580 PROCload(1):GCOL0,2
  590 MOVE204,lh%:DRAW196+lI%,lh%
  600 MOVE996,eh%:DRAW1004-eI%,eh%
  610 GCOL0,0
  620 MOVE204,lh%-M%:DRAW196+lI%,lh%-M%
  630 MOVE996,eh%+em:DRAW1004-eI%,eh%+em
  640 UNTIL eh%>700 OR eh%<300 OR lh%<30
0 OR M%=0
  650 GCOL0,2:MOVE204,lh%:DRAW196+lI%,lh
%
  660 MOVE996,eh%:DRAW1004-eI%,eh%
  670 IF M%=-1PRINTTAB(2,27)"The car is
too heavy for the effort."
  680 IF M%=1PRINTTAB(2,27)"The effort h
as lifted the car."
  690 IF M%=0PRINTTAB(14,27)"BALANCED!"
  700 PRINTTAB(2,30)"Press Space to cont
inue."
  710 REPEATUNTILINKEY-99
  720 ENDPROC
  730 DEFPROCinstruct
  740 PRINTTAB(12,1)"A HYDRAULIC JACK"TA
B(12,2)"----------------"
  750 PRINT''"A hydraulic jack is used t
o lift a car."''"The jack has two cylinde
rs which are"'"linked. Inside each cylin
der there"'"is a piston. The car rests o
n one"'"piston. Effort is used to push o
n"'"the other."
  760 PRINT'"You can alter the size of e
ach piston"'"and cylinder, the weight of
 the car"'"and how hard you push."
  770 PRINT'"Sometimes, all of the force
s will"'"balance and the car won't move
up or"'"down. Try to find out why this h
appens."
  780 PRINTTAB(2,22)"Press Space to star
t"
  790 REPEATUNTILINKEY-99
  800 ENDPROC
  810 DEFPROCaltervars
  820 *FX15,0
  830 PRINTTAB(10,3)"CHANGE THE VARIABLE
S"TAB(10,4)"--------------------"
  840 PRINTTAB(2,6)"Weight of car"TAB(2,
8)"Effort"TAB(2,10)"Diameter of load pis
ton"TAB(2,12)"Diameter of effort piston"
  850 PRINTTAB(2,22)"Press Return when r
eady"
  860 PRINTTAB(2,18)"Press Space to sele
ct"
  870 PRINTTAB(2,20)"Press < or > to cha
nge"
  880 X%=6
  890 REPEAT
  900 PRINTTAB(30,6);lI%TAB(30,8);eI%TAB(3
0,10);lI%TAB(30,12);eI%
  910 IF INKEY-99 X%=X%+2:IF X%>12 X%=6
  920 IF X%=6 AND INKEY-103 AND lI%>100 l
I%=lI%-100
  930 IF X%=6 AND INKEY-104 AND lI%<5000
lI%=lI%+100
  940 IF X%=8 AND INKEY-103 AND eI%>100 e
I%=eI%-100
  950 IF X%=8 AND INKEY-104 AND eI%<5000
eI%=eI%+100
  960 IF X%=10 AND INKEY-103 AND ll%>80
ll%=ll%-10
  970 IF X%=10 AND INKEY-104AND ll%<300
ll%=ll%+10
  980 IF X%=12 AND INKEY-103 AND el%>50
el%=el%-10
  990 IF X%=12 AND INKEY-104 AND el%<300
 el%=el%+10
 1000 PRINTTAB(30,X%);SPC(9)
 1010 TIME=0:REPEATUNTILTIME>5
 1020 UNTILINKEY(0)=13
 1030 ENDPROC
```

For the Electron, Archimedes, and BBC only

National Curriculum Attainment Targets covered

This program covers loads of those science attainment targets that all young scientists are working towards on the National Curriculum:

Target	Title	Levels
AT1	Exploration of Science	2,3,4,5,6 and 7
AT10	Forces	2,3 and particularly 6
AT13	Energy	3 and particularly 6
AT17	The Nature of Science	5

Try this!

See if you can find how to balance the system so that the car goes neither up nor down. Don't just find one case – see if you can find a pattern in what happens.

If you do well you should be able to say what the result will be no matter what weights and sizes are involved.

Incidentally, it's a good idea to work with a friend so that you can talk over your theories and swap ideas.

HOW A COMPUTER WORKS

Part 2

It's

The brain of a computer is called the CPU – which stands for Central Processing Unit. But before it can start working things out for us we need to put some facts and figures into it.

So this month let's look at how information gets from the outside world into our minature electronic world. This is usually done using a keyboard.

The technical term for what you feed into a computer is data. And the keyboard is only one of many things we can use.

It can be done in many other ways.

You may have a mouse or a joystick. When you're using them you're also feeding information into the computer – just as when you're using a keyboard. They're all input devices.

You can use a connector called a Midi interface to link a musical instrument to your computer. The instrument is then an input device for the computer.

And there are still more – tracker balls, light pens and scanners.

They all have one thing in common: They take information and turn it into electrical signals which represent numbers.

On the very first computers the only way to feed data in was through a row of switches. Turning them on and off in certain patterns sent information to the CPU. Now computers are much easier to use. They are said to be more user friendly.

But if you think the old idea of switches has been replaced by the keyboard think again. For this is still only a lot of switches – pressing a key just turns on a few at a time.

A keyboard is a rather slow way of getting data into your computer. It's much faster if you use a a tape recorder or disc drive.

These take data that has been stored as a magnetic pattern and change it into electrical pulses.

The CPU can read these pulses and carries out the coded instructions that they make up. Whether it's just a single letter or a complete game, the data reaches the CPU in pulses.

What it does with them will be revealed in the next month's *Let's Compute!*

INPUT DEVICES

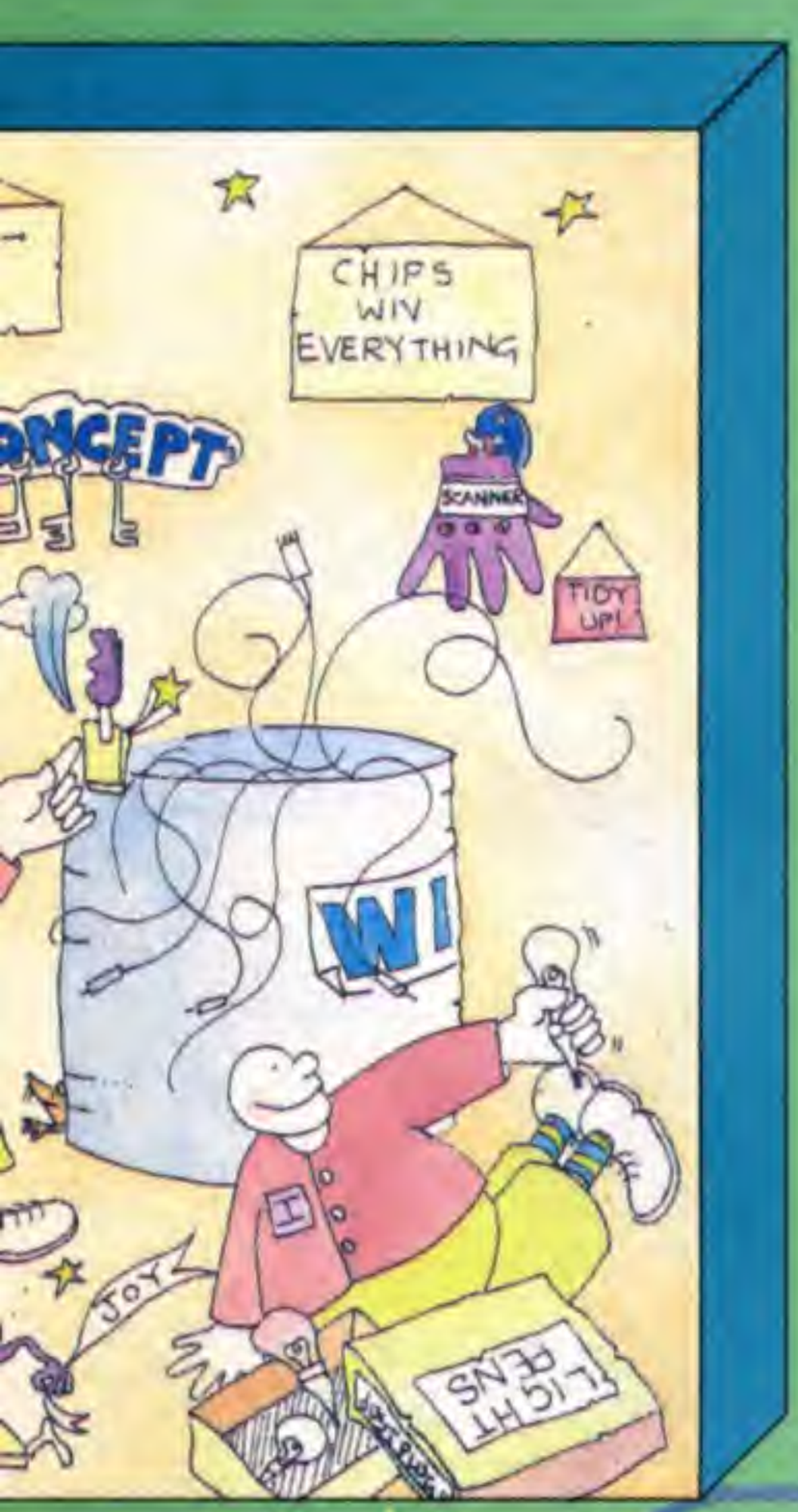
Keyboard

Pressing a key sends a coded number to the CPU. For example, the letter A is sent as the number 65. Each key has a different number – called it's Ascii code – between 0 and 255.

Joystick

Most joysticks contain five switches – one for each direction and one for fire. Whenever a switch is activated it sends a number to the CPU. Diagonal movements are detected if the numbers add up to the same as two single movements.

INPUT time



BINARY BITS

We count in Tens and Units. It works well – we can use our fingers (and thumbs) to count on.

But a computer works with switches and electrical pulses. They're either on or off, there or not there.

It's as if a computer has to count using only two fingers. So it uses Twos and Units.

Just like the way we count has a name – the decimal system – so the computer's way also has a name. It's called the binary system and it uses just 0 and 1.

When a switch is off it's called 0. When it's on it's 1.

Here are the numbers from one to seven using binary numbers:

1 10 11 100 101 110 111

It looks impossible to understand, but it's really easy.

Suppose you were told to count up to seven weeks using just zeros and ones.

All you have to do is count in weeks, fortnights and months. The table below shows how you can think of it.

So now you can already count up to seven in binary. In next month's *Let's Compute!* we'll go further along this clever road of counting.

months	fortnights	weeks	
		1	So 1 = 1 week
	1	0	So 10 = 2 weeks
	1	1	So 11 = 3 weeks
1	0	0	So 100 = 4 weeks
1	0	1	So 101 = 5 weeks
1	1	0	So 110 = 6 weeks
1	1	1	So 111 = 7 weeks

Counting up to 7 in binary

Mouse

A lot of computers now have a mouse as well as a keyboard.

It just converts movement in any direction into pulses which are decoded by the CPU.

Scanner

A scanner converts a picture on paper into an electronic image. As the scanner passes over the picture small electronic switches turn on and off depending on whether light or dark areas are detected.

NEXT MONTH: We look at how the CPU does its tricks!

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Introducing...

Castle of Adventure

Watch out for Mirrorsoft's Cadaver. It's a role-playing game with a difference. Everything's joystick controlled so there's no need for boring typing in.

You play a bounty-hunting dwarf searching a mysterious castle. It's stuffed with treasure, gripping puzzles and magical beasts.

Solve all the problems and you might get to kill the Necromancer and become exceedingly rich.

It's been programmed by the famous Bitmap Brothers. They're the team behind Speedball and Xenon 2. Due out shortly for the Atari ST and Amiga.

Budget Bonanza

Your pocket money doesn't stretch to full-price software very often? Don't despair – there are plenty of good budget games on the market. Some of the best are re-releases of old full-price classics.

Among the best of this month's bunch are Encore's Ace and Ace 2 (£2.99). These two brilliant flight sims are rolled into one for the Spectrum, C64 and CPC.

Conflict (£4.99), is a playable intro to wargaming. It's out on Virgin Mastertronic's 16-Blitz label for the PC, Amiga and Atari ST.

Charlie's Cheats!

Did you know that there is a built-in cheat for CPC Treasure Island Dizzy? At the title screen hold down A P C and SPACE until Dizzy appears. If you then press C during the game and use Z X K and M you can move from screen to screen. When you get to a screen you like press space and off you go.

Pam's Passwords

Peter's Patch

Matt Browne from Potters Bar has come up with a poke for Alternative's Microball (BBC Micro and Electron). This blocks off all the holes so that the ball can't be lost.

Just put your tape in the recorder and type the following:

```
LOAD "PINBALL"
160 CLS:PAGE=&1200
RUN
LOAD "LOADER"
2007 FOR A=&7C98 TO &7CDF:?A=127:NEXT
2008 FOR A=&6AB0 TO &6ABF:?A=126:NEXT
2009 FOR A=&6BC8 TO &6BD7:?A=126:NEXT
RUN
```

BACK TO THE FUTURE 2

The eagerly awaited Back to the Future 2 (Mirrorsoft £14.99, disc) is now available for CPC owners. The gameplay is not bad. But the mono graphics in the main part of the game disappoint.

It's nearly a year since Fighter Bomber, first appeared pn the PC. Now it's made it to the CPC screenson a £19.99 disc from Activision.

It features well produced 3D graphics amd mission objectives. A worthy successor to that old CPC favourite, After Burner.

Do watch out though – some CPC owners may have a problem. The protection on the disc version prevents it from loading on some machines.

COWABUNGA!

Are you a Turtle Maniac?

Is there anyone out there who isn't a fan of Leonardo, Raphael, Donatello and Michelangelo?

Those pizza-loving heroes in a half-shell are about to make their computer in a game from Image Works.

First on the shelves will be the PC and Amiga versions. Others will follow except for BBC and Archimedes users. Seems like they'll be missing out.

Teenage Mutant Hero Turtles is bound to be one of the hottest releases this Christmas. So get saving. Cowabunga!

PIPEMANIA

Pam and her minions have been working hard on Empire's addictive puzzle game Pipemania. Here's the full list of passwords for the Amiga and C64. Can anyone help with the others?

Amiga	C64
Level 5: GRIP	Level 5: HAHA
Level 9: TICK	Level 9: GRIN
Level 13: DOCK	Level 13: REAP
Level 17: OOZE	Level 17: SEED
Level 21: BLOB	Level 21: GROW
Level 25: BALL	Level 25: TALL
Level 29: WILD	Level 29: YALI

NEVRYON

Are you a follower of Fourth Dimension's Nevryon? Here are the Archimedes passwords as discovered by James Marshall and David Horner from Tollerton:

Level 3: MIRADOR
Level 5: ISENGARD
Level 7: KRYNN

Mathew Elliot from Royston has supplied the passwords for the BBC Micro version:

Level 3: ARCHIE
Level 5: STEREO
Level 7: REBEL

If you've got any hints, pokes or cheats you'd like us to print send them in to us at Let's Compute! Europa House, Adlington Park, Macclesfield SK10 4NP.

Think you know a lot about pop music? Here's a program to test you out.

TINA'S TEST

If you fancy being a quizmaster – now's your chance!

Clever Tina Turtle has devised a Pop Quiz you can play on your computer. And she's made it easy for you to change it into any type of quiz you like.

After you've typed in the program and RUN it you'll be asked 10 questions. Get one right and you move on to the next.

If you get one wrong, you'll be given the right answer before you move on to the next question. Note that as the data is all in capitals you must answer in capitals.

Once you've answered all 10 questions you're given your score and a message.

At the moment there are two messages – printed by Lines 190 and 200. You can easily change them or – by inserting more similar lines – add messages of your own.

If you want to add more questions change Line 330 to say how many there are in all. Then add more lines similar to those already at 350 to 440 at the end of the program.

Start numbering the extra DATA statements at Line 450.

Obviously, if you wish you can change all the data at the end of the program and put anything you want there. Geography, history, trivial pursuit – any type of question will do. Don't forget that if you change the type of quiz you'll also have to alter lines 100 and 120. This simple quiz has many uses. If you come up with any novel questions and answers let us see them. There will be a prize for any DATA lines we pin to the noticeboard.

```
   10  REM Pop quiz
   20  REM (c)Let's Compute!
   30  READ M
   40  DIM S$(M):DIM $(M)
   50  LET P=0
   60  FOR C=1 TO M
   70  READ S$(C),G$(C)
   80  NEXT
   90  CLS
  100  PRINT:PRINT "Let's Compute! Pop Q
uiz"
  110  FOR C=1 TO M
  120  PRINT:PRINT "Which group or artis
t sang ":PRINT S$(C);"?"
  130  INPUT A$
  140  PRINT
  150  IF A$=G$(C) THEN GOSUB 230
  160  IF A$<>G$(C) THEN GOSUB 270
  170  NEXT
  180  PRINT:PRINT:PRINT "You got ";P;"
 out of ";M
  190  IF P>0.75*M THEN PRINT "That's no
t bad"
  200  IF P<=0.75*M THEN PRINT "You coul
d do better"
  210  PRINT
  220  END
  230  REM RIGHT ANSWER SUBROUTINE
  240  PRINT "Well done, you're right"
  250  LET P=P+1
  260  RETURN
  270  REM WRONG ANSWER SUBROUTINE
  280  PRINT "Hard luck! You're wrong"
  290  PRINT "The right answer is: ";G$(
C)
  300  RETURN
  310  REM DATA LINES
  320  REM NEXT IS NUMBER OF QUESTIONS
  330  DATA 10
  340  REM NEXT ARE SONGS,GROUPS
  350  DATA "ITSY BITSY TEENY WEENY","BO
MBALURINA"
  360  DATA "TURTLE POWER","PARTNERS IN
KRYME"
  370  DATA "LISTEN TO YOUR HEART","ROXE
TTE"
  380  DATA "NAKED IN THE RAIN","BLUE PE
ARL"
  390  DATA "TONIGHT","NEW KIDS ON THE B
LOCK"
  400  DATA "YOU CAN'T TOUCH THIS","MC H
AMMER"
  410  DATA "WHERE ARE YOU BABY?","BETTY
BOO"
  420  DATA "ENGLISHMAN IN NEW YORK","ST
ING"
  430  DATA "PRAYING FOR TIME","GEORGE M
ICHAEL"
  440  DATA "THIEVES IN THE TEMPLE","PRI
NCE"
```

IS YOUR MACHINE HERE?

Electron/BBC/Archimedes/ ST (Stos)/Amiga (Amos)/ PC (GW-Basic)

The program will work as shown.

Commodore 64/128

Use capital letters throughout.
Change line 90 to:

```
90 PRINT CHR$(147)
```

Spectrum

Use 48k mode.
Change line 40 to:

```
40 DIM S$(M+1,32):DIM G$(M,32):
DIM A$(32)
```

Insert a new line.

```
135 IF LEN(A$)<10 THEN LET A$=A$+" ":GO
TO 135
```

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MINI OFFICE 2 (40 TRACK)	BB	N/A	11.99	13.99
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GRAHAM GOOCH	EL	1.99	STEVE DAVIS SNOOKER	BB/EL	1.99
GREEN BERET	BB	2.99	STORM CYCLE	BB/EL	1.99
GRID IRON 2	BB/EL	2.99	STRIP POKER	BB	2.99
GUN FIGHTER	BB/EL	1.99	STRYKERS RUN	BB/EL	2.99
HI Q QUIZ	BB/EL	2.99	SUMMER OLYMPIAD	BB/EL	2.99
HOB GOBLIN	BB/EL	2.99	TETRIS	BB/EL	2.99
HOWZAT TRIPLE PACK	BB/EL	1.99	THRUST	BB/EL	2.99
HYPER SPORTS	BB	2.99	TRAPPER	BB/EL	1.99
JOE BLADE	BB/EL	1.99	TURF FORM	BB/EL	2.99
JOE BLADE 2	BB	1.99	YIE AR KUNG FU	BB/EL	2.99
KARATE COMBAT	BB/EL	2.99			

COMPILATIONS

PLAY IT AGAIN SAM 13	BARBARIAN 2, PERCY PENGUIN, HYPERBALL & PANDEMONIUM. BB/EL CASS 6.99. BB 5.25 DISC 8.99. BB 3.5 DISC 9.99
PLAY IT AGAIN SAM 12	LAST NINJA, BY FAIR MEANS OR FOUL, SKIRMISH & BLAGGER. BB/EL CASS 6.99. BB 5.25 DISC 8.99. BB 3.5 DISC 9.99
PLAY IT AGAIN SAM 11	BARBARIAN, PIPELINE, BARON & MONSTERS. BB/EL CASS 6.99. BB 5.25 DISC 8.99. BB 3.5 DISC 9.99
PLAY IT AGAIN SAM 9	CAMELOT, STEVE DAVIS SNOOKER, SPYCAT & THE LIFE OF REPTON. BB/EL CASS 6.99. BB 5.25 DISC 8.99
PLAY IT AGAIN SAM 8	WINTER OLYMPIAD, QUEST, MR WIZ & AROUND THE WORLD IN FORTY SCREENS. BB/EL CASS 6.99. BB 5.25 DISC 8.99
PLAY IT AGAIN SAM 7	FIRETRACK, BONE CRUSHER, SNAPPER & GHOULS. BB/EL CASS 6.99. BB 5.25 DISC 8.99
PLAY IT AGAIN SAM 6	GALAFORCE 2, HUNCHBACK, HOPPER SENTINEL (BB ONLY), VIDEO'S REVENGE (EL ONLY). BB/EL CASS 6.99. BB 5.25 DISC 8.99
PLAY IT AGAIN SAM 5	IMOGEN, ELIXIR, BUG BLASTER, FORTRESS (BB ONLY), MOONRAIDER (EL ONLY). BB/EL CASS 6.99. BB 5.25 DISC 8.99
PLAY IT AGAIN SAM 4	FRAK, GRAND PRIX CONSTRUCTION SET, SPELLBINDER & COSMIC CAMOUFLAGE. BB/EL CASS 6.99. BB 5.25 DISC 8.99

BBC UTILITIES

ART ROOM	MASTER/COMPACT	19.99	BROM PLUS (EPROM)		29.99
ARTROOM PACK	MASTER/COMPACT	24.99	BROM PLUS DISC	COMPACT/ADFS/DFS	24.99
FONTWISE +	COMPACT/ADFS/DFS	16.99	MACROM (EPROM)		32.99
FONTWISE + PACK	COMPACT/ADFS/DFS	24.99	MACROM DISC	COMPACT/ADFS/DFS	29.99
FONT EDITOR	COMPACT/ADFS/DFS	16.99	BETA BASE	COMPACT/ADFS/DFS	19.99
RAMROD (EPROM)		32.99	BETA BASE UTILITIES	COMPACT/ADFS/DFS	10.99
RAMROD DISC	COMPACT/ADFS/DFS	27.99	BETA BASE PACK	COMPACT/ADFS/DFS	24.99

ARCHIMEDES

APOCALYPSE	24.99	INERTIA	17.99
ARCADE SOCCER	17.99	INTERDICTOR (FLIGHT SIM)	29.99
E-TYPE	17.99	MAN AT ARMS	13.99
E-TYPE DESIGNER	14.99	MANCHESTER UNITED	16.99
E-TYPE EXTRA 100 MILES	14.99	NEVRYON	17.99
HOLED OUT	17.99	THE OLYMPICS	17.99
HOLED OUT EXTRA VOL 1	14.99	SUPERIOR GOLF CONSTRUCTION SET	13.99
HOLED OUT EXTRA VOL 2	14.99	U.I.M.	24.99
HOLED OUT DESIGNER	17.99	WHITE MAGIC	17.99
HOVERBOD	9.99	WHITE MAGIC 2 + DESIGNER	17.99

ARCHIMEDES UTILITIES

ARCHIMEDES TOOLKIT	37.99	RENDER BENDER	59.99
PRO ARTISAN	79.99	TEMPEST(DTP)	109.99
ARTISAN 2	47.99	5 1/4 UNBRANDED DISCS	.35 EACH
ARTISAN UPGRADE	24.99		2.99 /10
ARTISAN GALLERY (3 DISCS)	12.99		8.99 /25
ARMADEUS	59.99		
ARMADEUS SAMPLER BOARD	139.99	3 1/2 UNBRANDED DISCS	.79 EACH
KNOWLEDGE ORGANISER	47.99		6.99 /10
PRIMARY WORD PROCESSOR	32.99		16.99 /25

SPECTRUM CBM AND AMSTRAD

FULL PRICE	CASS	DISC
ADIDAS CHAMPIONSHIP FOOTBALL	8.99	9.99
BACK TO THE FUTURE 2	NEW 7.50	9.99
BATMAN THE MOVIE	6.99	9.99
BATTLE OF THE BULGE	NEW 8.99	9.99
BLACK TIGER	6.99	9.99
BLOODWYCH	6.99	9.99
CABAL	6.99	9.99
CARRIER COMMAND	9.99	11.99
CHASE H.Q.	6.99	9.99
CRACKDOWN	7.50	9.99
CRAZY CARS	6.99	N/A
CRICKET MASTER	6.99	N/A
DAN DARE 3	6.99	9.99
DOUBLE DRAGON	6.99	9.99
DRAGONS OF FLAME	NEW 7.50	9.99
THE DUEL (TEST DRIVE 2)	6.99	9.99
DYNASTY WARS	7.50	9.99
E-MOTION	7.50	9.99
EMLYN HUGHES	6.99	9.99
ESCAPE PLANET ROBOT MONSTERS	6.99	9.99
FIENDISH FREDDY	6.99	9.99
FIGHTER BOMBER	9.99	13.99
FOOTBALL DIRECTOR	6.99	N/A
FOOTBALL DIRECTOR 2 (128k)	N/A	13.99
FOOTBALL MANAGER WORLD CUP ED	6.99	9.99
FOOTBALL MANAGER 2 + EXPANSION	6.99	9.99
GHOULS AND GHOSTS	6.99	9.99
GUNSHIP	9.99	13.99
HAMMERFIST	6.99	9.99
HEAVY METAL	6.99	9.99
HOSTAGES	NEW 6.99	9.99

FULL PRICE	CASS	DISC
INDIANA JONES LAST CRUSADE	6.99	9.99
INTERNATIONAL 3-D TENNIS	6.99	9.99
KICK OFF	6.99	9.99
KLAX	6.99	9.99
LORDS OF CHAOS	NEW 6.99	9.99
MANCHESTER UNT	6.99	9.99
MICROPROSE SOCCER	9.99	13.99
NEW ZEALAND STORY	6.99	9.99
OPERATION THUNDERBOLT	6.99	9.99
ORIENTAL GAMES	NEW 9.99	13.99
PIPEMANIA	6.99	9.99
PRO TENNIS TOURNAMENT	8.99	11.99
RAINBOW ISLAND	6.99	9.99
RICK DANGEROUS	6.99	9.99
ROBOCOP	6.99	9.99
SHADOW WARRIORS	6.99	9.99
STARGLIDER 2	9.99	13.99
STAR WARS TRILOGY	8.99	13.99
STRIDER	6.99	9.99
STUNT CAR	6.99	9.99
TIE BREAK	NEW 6.99	9.99
TOLKIEN TRILOGY	8.99	11.99
TRACKSUIT MANAGER	6.99	N/A
TREBLE CHAMPIONS	6.99	N/A
TURBO OUTRUN	6.99	9.99
TURRICAN	6.99	9.99
THE UNTOUCHABLES	6.99	9.99
VENDETTA	6.99	9.99
VULCAN	6.99	N/A
WORLD BOXING MANAGER	6.99	N/A
ZOMBIE	6.99	9.99

COMPILATIONS

HEROES	BARBARIAN 2, RUNNING MAN, STAR WARS & LICENCE TO KILL. CASS 9.99 DISC 13.99
CECCO COLLECTION	STORMLORD, EXOLON, CYBERNOID 1 & 2. CASS 2.99
QUATTRO ADVENTURE	DIZZY, GHOST HUNTERS, SUPER ROBIN HOOD & VAMPIRE. CASS 2.99
WORLD CUP COMPILATION	KICK OFF, GARY LINEKERS HOTSHOTS & TRACKSUIT MANAGER. CASS 8.99
COMPLETE GAMES CENTRE	BRIAN CLOUGH'S FOOTBALL FORTUNES, WIZARD'S LAIR, HI Q QUIZ, ICE TEMPLE, STEVE DAVIS SNOOKER, WOLFPACK, SYNTAX, CASTLE BLACKSTAR, POOL & PINBALL. CASS 8.99
QUATTRO POWER	MOTO CROSS SIM, TWIN TURBO V8, POWERBOAT RACING & ATV SIM. CASS 2.99
QUATTRO SPORTS	PRO SNOOKER, GRAND PRIX SIM, PRO SKI AND BMX SIM. CASS 2.99
THE BIZ	R-TYPE, OPERATION WOLF, DOUBLE DRAGON, BATMAN THE CAPED CRUSADER. CASS 9.99
MEGA MIX	OPERATION WOLF, BARBARIAN 2, DRAGON NINJA & REAL GHOSTBUSTERS. CASS 9.99
WINNERS	INDIANA JONES TEMPLE OF DOOM, BLASTEROIDS, LED STORM, THUNDERBLADE, IMP MISSION 2. CASS 9.99 DISC 13.99
100% DYNAMITE	AFTERBURNER, LAST NINJA 2, WEC LE MANS DOUBLE DRAGON. CASS 9.99
TAITO COIN OPS	RASTAN, FLYING SHARK, ARKANOID 1 AND 2, SLAPFIGHT BUBBLE BOBBLE, RENEGADE AND LEGEND OF KAGE. CASS 8.99
IN CROWD	KARNOV, GRYZOR, BARBARIAN, CRAZY CARS, PREDATOR, COMBAT SCHOOL, PLATOON AND TARGET RENEGADE. CASS 9.99
SUPREME CHALLENGE	PETER BEARDSLEY'S INT. FOOTBALL, SOCCER SUPREMO, FOOTBALL MANAGER, WORLD
SOCCER SPECTACULAR	CHAMPIONS AND PETER SHILTON'S HANDBALL MARADONA. CASS 4.99
SUPREME CHALLENGE	ELITE, STARGLIDER, ACE 2, SENTINEL AND TETRIS. CASS 5.50
GAME SET AND MATCH 2	MATCH DAY 2, SUPERBOWL, WINTER OLYMPIAD, NICK FALDO, CHAMPIONSHIP SPRINT, TRACK AND FIELD, STEVE DAVIS SNOOKER & SUPER HANG ON. CASS 8.99
COIN OP HITS	OUTRUN, ROAD BLASTERS, SPY HUNTER, THUNDERBLADE & BIONIC COMMANDO. CASS 9.99 DISC 13.99
GIANTS	ROLLING THUNDER, GAUNTLET 2, 720, OUTRUN CALIFORNIA GAMES. CASS 9.99 DISC 13.99
SUMMERTIME SPECIAL	SOLOMONS KEY, BRAVESTARR, CAPTAIN AMERICA, TRANTOR, WORLD CLASS LEADERBOARD & RYGAR. CASS 5.50 SPECTRUM ONLY
THRILLTIME GOLD 1	PAPERBOY, GHOSTS AND GOBLINS, BOMBJACK, BATTY & TURBO ESPRIT. CASS 6.99
THRILLTIME GOLD 2	AIRWOLF, SCOOBY DOO, BATTLESHIPS, SABOTEUR & FRANK BRUNO. CASS 6.99
THRILLTIME GOLD 3	COMMANDO, 1942, SPITFIRE, COMBAT LYNX, DEEP STRIKE. CASS 6.99
THRILLTIME PLAT 1	BUGGY BOY, SPACE HARRIER, LIVE AND LET DIE, OVERLANDER, DRAGON'S LAIR, THUNDERCATS, BEYOND THE ICE PALACE, GREAT GURIANOS, HOPPING MAD & HARD WARRIORS. CASS 8.99

ARE CITY

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ATARI ST/AMIGA

FULL PRICE	CASS	DISC
3-D POOL	SPECIAL OFFER 9.99	9.99
688 SUBMARINE SIM	N/A	16.99
A.M.C. (ASTRO MARINE CORPS)	13.99	N/A
A.M.O.S. GAMES CREATOR	N/A	34.99
ANARCHY	NEW 13.99	13.99
ANCIENT BATTLES	16.99	N/A
ANT HEADS (Came from the desert add-on)	N/A	9.99
B.S.S. JANE SEYMOUR NEW. INCLUDES FREE FEDERATION OF FREE TRADERS WHILE STOCKS LAST	16.99	16.99
BACK TO THE FUTURE 2	NEW 16.99	16.99
BACKLASH	NEW PRICE 4.99	4.99
BALANCE OF POWER 1990	16.99	16.99
BANGKOK KNIGHTS	SPECIAL OFFER N/A	9.99
BARBARIAN (PALACE)	6.99	6.99
BARBARIAN (PSYGNOSIS)	6.99	6.99
BATMAN THE MOVIE	SPECIAL OFFER N/A	9.99
BATTLE CHESS	16.99	16.99
BATTLE OF BRITAIN (THEIR FINEST HOUR)	19.99	19.99
BATTLE MASTER	19.99	19.99
BATTLESHIPS	6.99	6.99
BEYOND THE ICE PALACE	6.99	6.99
BLASTEROIDS	SPECIAL OFFER 6.99	6.99
BLOODMONEY	SPECIAL OFFER 9.99	9.99
BLOODWYCH	SPECIAL OFFER 9.99	9.99
BLOODWYCH DATA DISC	9.99	9.99
BOMBJACK	6.99	6.99
BOULDERDASH	4.99	4.99
BREACH 2	16.99	16.99
BRIDGE PLAYER 2150	19.99	19.99
BUGGY BOY	6.99	6.99
CAPTAIN BLOOD	6.99	6.99
CARRIER COMMAND	SPECIAL OFFER 9.99	9.99
CASTLE MASTER	16.99	16.99
CHAMPIONS OF KRYNN (1 MEG)	N/A	19.99
CHAOS STRIKES BACK	16.99	N/A
CHAOS STRIKES BACK EDITOR	9.99	N/A
CHASE H.Q.	13.99	16.99
CHESSMASTER 2000	SPECIAL OFFER N/A	9.99
CHRONOQUEST 2	19.99	19.99
CLOUD KINGDOMS	SPECIAL OFFER N/A	6.99
CODENAME ICEMAN (1 MEG)	N/A	27.99
COLONELS BEQUEST	N/A	27.99
COMBO RACER	16.99	16.99
COMMANDO	13.99	13.99
CONQUEST CAMELOT	N/A	26.99
CYBERBALL	13.99	13.99
DAILY DOUBLE HORSE RACING	13.99	13.99
DAMOCLES	16.99	16.99
DELUXE STRIP POKER	13.99	13.99
DIZZY DICE	4.99	4.99
DOUBLE DRAGON 2	13.99	13.99
DRAGONS BREATH	19.99	19.99
DRAGON FORCE (1 MEG)	N/A	19.99
DRAGONS LAIR	29.99	29.99
DRAGONS OF FLAME	16.99	16.99
DUNGEON MASTER	16.99	16.99
DUNGEON MASTER + CHAOS STRIKES BACK	19.99	N/A
DUNGEON MASTER EDITOR	6.99	6.99
E-MOTION	13.99	16.99
EAST V WEST	16.99	16.99
ELF	4.99	4.99

FULL PRICE	CASS	DISC
ELIMINATOR	NEW PRICE 4.99	4.99
ELITE	SPECIAL OFFER 12.99	12.99
EMLYN HUGHES INT SOCCER	16.99	16.99
ESCAPE FROM SINGE'S CASTLE	N/A	29.99
ESCAPE - ROBOT MONSTERS	13.99	13.99
F16 COMBAT PILOT	16.99	16.99
F19 STEALTH	21.99	21.99
F29 RETALIATOR	16.99	16.99
FALCON	16.99	19.99
FALCON MISSION DISC 1 OR 2	13.99	13.99
FAST LANE	4.99	4.99
FIENDISH FREDDY	SPECIAL OFFER 9.99	N/A
FIGHTER BOMBER	19.99	19.99
FIGHTER BOMBER MISSION DISC	N/A	9.99
FIGHTER SOCCER	SPECIAL OFFER 6.99	6.99
FIRE AND BRIMSTONE	16.99	16.99
FIRE BRIGADE (1 MEG)	19.99	19.99
FUMBO'S QUEST	N/A	16.99
FLOOD	16.99	16.99
FOOTBALL DIRECTOR 2	13.99	13.99
FOOTBALL MANAGER	4.99	4.99
FOOTBALL MANAGER 2 & EXPANSION KIT	13.99	13.99
FOOTBALL MANAGER WORLD CUP ED	13.99	13.99
FOOTBALLER OF THE YEAR 2	N/A	9.99
FORMULA ONE GRAND PRIX	4.99	4.99
FUTURE WARS	16.99	16.99
GALAXY FORCE	SPECIAL OFFER N/A	6.99
GARY LINEKER'S HOTSHOTS	6.99	6.99
GAUNTLET 2	6.99	6.99
GHOSTS AND GOBLINS (1 MEG)	13.99	13.99
GHOSTBUSTERS 2	SPECIAL OFFER 6.99	N/A
GHOULS AND GHOSTS	16.99	16.99
GIN AND CRIBBAGE	N/A	21.99
GRAND SLAM TENNIS	NEW N/A	4.99
GRAVITY	16.99	16.99
GRIDIRON	SPECIAL OFFER 9.99	N/A
GUARDIAN ANGELS	NEW 6.99	6.99
GUNSHIP	16.99	16.99
HAMMERFIST	16.99	16.99
HARDBALL 2	N/A	16.99
HARD DRIVIN'	N/A	9.99
HARLEY DAVIDSON	19.99	19.99
HEROES QUEST (1 MEG)	N/A	24.99
HONDA RVF 750	16.99	16.99
HORSE RACING	N/A	16.99
HORSE RACING OWNERS MODULE	N/A	9.99
IKARI WARRIORS	6.99	6.99
IMPERIUM	16.99	16.99
IMPOSSAMOLE	13.99	16.99
IMPOSSIBLE MISSION 2	6.99	6.99
INDIANA JONES LAST CRUSADE	13.99	13.99
INDIANA JONES THE ADVENTURE	16.99	16.99
INFESTATION	SPECIAL OFFER 9.99	9.99
IT CAME FROM THE DESERT (1 MEG ONLY (SPECIAL OFFER)	N/A	14.99
INT CHAMPIONSHIP WRESTLING	N/A	16.99
INTERNATIONAL SOCCER	3.99	3.99
IVANHOE	13.99	16.99
JACK NICKLAUS GOLF	16.99	16.99
KARATE KID 2	3.99	3.99
KHALAAN	16.99	16.99
KICK OFF	13.99	13.99

FULL PRICE	CASS	DISC
KICK OFF 2 + WORLD CUP	16.99	16.99
KICK OFF EXTRA TIME	6.99	6.99
KINGS QUEST 4	N/A	24.99
KLAX	13.99	13.99
L.E.D. STORM	SPECIAL OFFER N/A	6.99
LAST NINJA 2	16.99	16.99
LEISURESUIT LARRY	16.99	16.99
LEISURESUIT LARRY LOOK FOR LOVE	19.99	24.99
LEISURESUIT LARRY 3	26.99	26.99
LIFE AND DEATH	16.99	16.99
LOOM	19.99	19.99
THE LOST PATROL	NEW 13.99	16.99
MANCHESTER UNITED	13.99	16.99
MANHUNTER IN SAN FRANCISCO	N/A	19.99
MANIC MINER	N/A	6.99
MARBLE MADNESS	6.99	6.99
MARIA WHITTAKER	SPECIAL OFFER 4.99	N/A
MATRIX MARAUDERS	NEW N/A	13.99
MIDNIGHT RESISTANCE	16.99	16.99
MIDWINTER	19.99	19.99
MIGHT AND MAGIC 2	N/A	19.99
MILLENIUM 2.2	12.99	N/A
MOONWALKER	SPECIAL OFFER 6.99	6.99
MR DO RUN RUN	NEW 9.99	9.99
NEVER MIND	SPECIAL OFFER 6.99	N/A
NEW ZEALAND STORY	13.99	16.99
NUCLEAR WAR	N/A	16.99
ON SAFARI	4.99	4.99
OPERATION STEALTH	NEW 16.99	16.99
OPERATION THUNDERBOLT	13.99	16.99
ORIENTAL GAMES	NEW 16.99	16.99
OUTRUN	6.99	6.99
OVERLANDER	6.99	6.99
PAPERBOY	13.99	13.99
PASSING SHOT	SPECIAL OFFER 6.99	N/A
PINBALL MAGIC	13.99	16.99
PIPEMANIA	SPECIAL OFFER 11.99	N/A
PIRATES	16.99	16.99
PLAGUE	N/A	16.99
PLAYER MANAGER	13.99	13.99
POLICE QUEST 2	N/A	24.99
POPULOUS	16.99	16.99
POPULOUS NEW WORLDS	6.99	6.99
PRO TENNIS TOUR	16.99	16.99
PROJECTILE	16.99	16.99
PUB TRIVIA	4.99	4.99
THE PUNISHER	NEW 13.99	13.99
QUARTET (4 VOICE SYNTHESISER)	36.99	N/A
QUESTION OF SPORT	SPECIAL OFFER 4.99	4.99
R-TYPE	SPECIAL OFFER 6.99	6.99
RAINBOW ISLAND	13.99	16.99
RED STORM RISING	6.99	16.99
RENAISSANCE	13.99	13.99
RESOLUTION 101	16.99	16.99
RICK DANGEROUS	16.99	16.99
RINGS OF MEDUSA	19.99	19.99
RISK	13.99	13.99
ROADBLASTER	6.99	6.99
ROBOCOP	13.99	16.99
ROBKE'S DRIFT	16.99	16.99
ROTOX	16.99	16.99
ROY OF THE ROVERS	NEW PRICE 4.99	N/A

FULL PRICE	CASS	DISC
SHADOW OF THE BEAST	NEW PRICE N/A	16.99
SHADOW OF THE BEAST 2	NEW N/A	24.99
SHADOW WARRIORS	13.99	16.99
SHERMAN M4	13.99	16.99
SHOOT 'EM UP CONSTRUCTION KIT	19.99	19.99
SILENT SERVICE	SPECIAL OFFER 9.99	9.99
SIM CITY	19.99	19.99
SIM CITY EDITOR	N/A	9.99
SKIDZ	13.99	16.99
SKYFOX	SPECIAL OFFER 6.99	N/A
SNOOPY	SPECIAL OFFER 6.99	N/A
SPACE ACE	29.99	29.99
SPACE QUEST 3	N/A	29.99
SPY V SPY 1 OR 2 OR 3	4.99	4.99
STAR RAY	4.99	4.99
STARBLADE	16.99	16.99
STORM ACROSS EUROPE	N/A	19.99
STRIDER	13.99	16.99
STUNT CAR RACER	SPECIAL OFFER N/A	9.99
SUMMER OLYMPIAD	4.99	4.99
SUPER CARS (GREMLIN)	13.99	13.99
SUPER HANG-ON	SPECIAL OFFER 6.99	6.99
SWORD OF ARAGON	N/A	19.99
T.V. SPORTS BASKETBALL	N/A	19.99
T.V. SPORTS FOOTBALL	16.99	14.99
TARCHAN	4.99	4.99
TEENAGE MUTANT NINJA TURTLES	N/A	19.99
TENNIS CUP	13.99	16.99
TEST DRIVE 2	N/A	16.99
THUNDERCATS	6.99	6.99
THUNDERSTRIKE	16.99	16.99
TIE BREAK TENNIS	13.99	16.99
TIMES OF LORE	16.99	16.99
TOWER OF BABEL	SPECIAL OFFER 9.99	9.99
TRACKSUIT MANAGER	NEW PRICE 4.99	4.99
TREASURE ISLAND DIZZY	4.99	4.99
TREBLE CHAMPIONS	13.99	13.99
TURBO CUP CAR RACING SIM	4.99	4.99
TURBO OUTRUN	13.99	16.99
TURN IT	NEW 13.99	13.99
TURRICAN	N/A	13.99
TUSKER	13.99	16.99
U.M.S. 2	NEW 19.99	19.99
ULTIMA 5	19.99	N/A
ULTIMATE GOLF-GREG NORMAN	16.99	16.99
UNREAL	N/A	19.99
VENUS FLY TRAP	13.99	13.99
VIGILANTE	9.99	9.99
VIKING CHILD	NEW N/A	16.99
WAR IN MIDDLE EARTH	13.99	13.99
WAYNE GRETZKY HOCKEY	16.99	16.99
WATERLOO	N/A	16.99
WINGS (1 MEG ONLY)	N/A	19.99
WINGS OF FURY	NEW N/A	16.99
WORLD BOXING MANAGER	13.99	13.99
WORLD CLASS LEADERBOARD	6.99	6.99
X-OUT	13.99	13.99
XENOMORPH	16.99	16.99
XENON 2	SPECIAL OFFER 12.99	12.99
YES PRIME MINISTER	NEW 4.99	4.99
ZOMBI	13.99	16.99

SIXTEEN BIT COMPILATIONS

GREMLIN TRIPLE PACK	AXELS MAGIC HAMMER, SWITCHBLADE & MINDBENDER ST AND AMIGA 16.99
HEROES PREMIER COLLECTION 2	BARBARIAN 2, RUNNING MAN, STAR WARS & LICENCE TO KILL. ST AND AMIGA 19.99
STORY SO FAR VOL 1	MERCENARY, ELIMINATOR, BACKLASH & CUSTODIAN ST ONLY 9.99
WORLD CUP COMPILATION	IKARI WARRIORS, BUGGY BOY, BATTLESHIPS & BEYOND THE ICE PALACE ST 9.99
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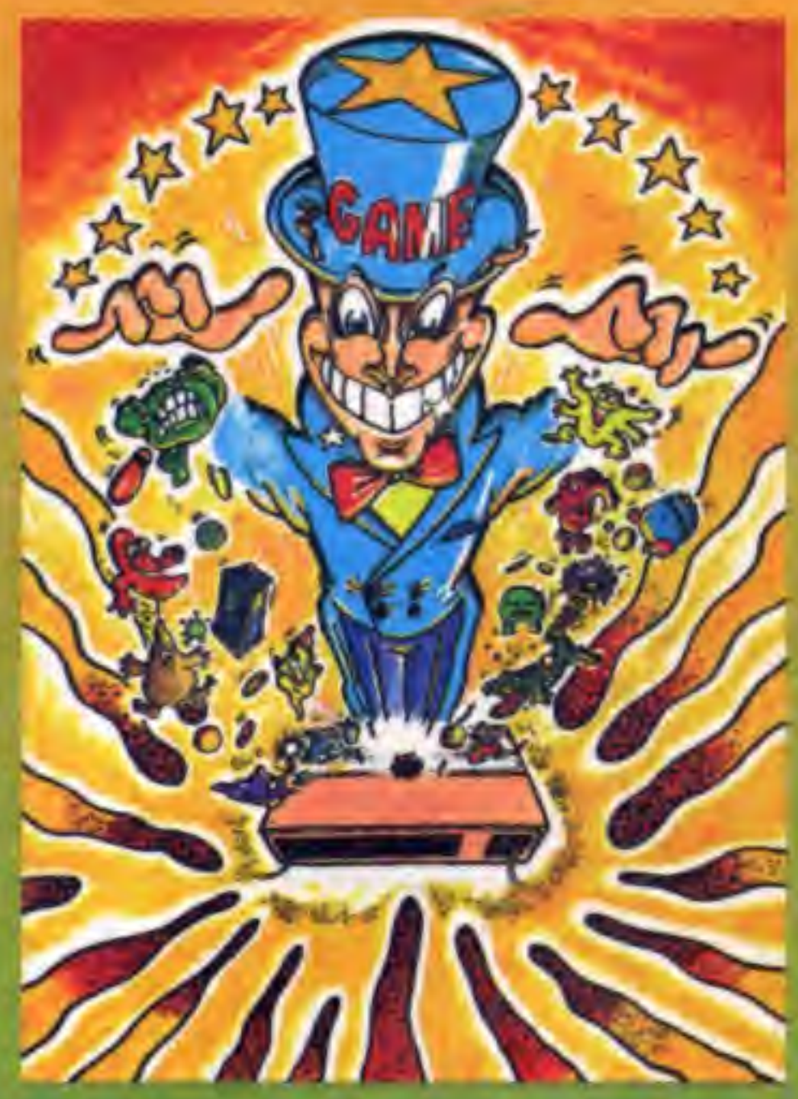
LETSC10

GAMES MAGIC

For the Electron, Archimedes, and BBC only

More objects means more fun. Our ace artist Mike Goldberg continues building his mega game



The last two month's listings gave you a basic game with monsters, a few objects to collect and hyperspace. If you've typed them in you're now ready to add this month's features.

So what's new? Well, to start with you'll find the baddies laying bombs at random intervals. March into one and you'll die!

But if a baddie touches a bomb it only moves to another part of the screen. So beware! It could move right in front of you.

Another object added by this listing is a twin symbol. If a baddy moves over this it creates two clones of itself. You could end up with as many as 12 monsters.

The idea is to reach these objects before the baddies.There's also £ symbols which give you a bonus when you collect them.

And watch out for the yellow OFF switch. Run over it and the baddies will grind to a standstill for a few seconds.

The final new object is the thumbs-up sign. When you run over one all the bombs disappear.

Before adding the new features to your existing program you need to renumber it. How you do this is explained on the right. Then just type in the listing and your program will be modified automatically.

The lines printed in red are new ones. Blue indicates lines altered. And if you type in the line numbers shown in orange these old lines will be removed.

The green areas show you all the new procedures and the REM lines explain what they do.

When you've made these changes save the game using a different name to the one you used before.

Your game will now have all the extra features we've described. Enjoy playing until next month when we'll show how to give your game a final polish.

Renumbering last month's program

Here's how to renumber last month's program ready to enter this month's extra bits:

- **LOAD last month's program**
- **Type RENUMBER and press Return**
- **SAVE the renumbered program (use a different name)**
- **Type DELETE 10,1840 and press Return so you're left with just the DATA lines.**
- **Type RENUMBER 8000, (note the comma) and press Return. This renumbers the data lines so they can stay at the end of the program.**
- **Save the data lines to tape or disc using the following commands:**

```
*SPOOL DATA
LIST
```

After the lines have listed key:

```
*SPOOL
```

- **LOAD the renumbered program that you saved a few minutes ago.**
- **Delete the existing data lines by typing DELETE 1850, (note the comma).**
- **Put the renumbered data lines (the ones you saved using *SPOOL) on the end of the program by entering:**

```
*EXEC DATA
```

- **LIST the program to check that the main part is numbered from 10 to 1840 and the data is from 8000 upwards. If it is, SAVE it. If not, try again – taking care to follow these instructions exactly.**

```
  90 DIMU%(12),V%(12)
 110
 111 DIMd$(2)
 112 ob%=4:DIMo$(ob%)
 113 no%=7:DIMha%(no%)
 114 FORI%=2TOno%:READha%(I%):NEXT
 115 DATA7,64,4,112,240,1
 182 IFRND(30)=1PROCrnd
 200 IfstpI=0PROCbad
 202 IFstpI=1:IFRND(100)=1stpI=0
 461 VDU23,229,64,64,32,16,0,24,60,126
 462 VDU23,230,102,106,102,106,102,126,
60,24
 463 VDU23,231,0,5,37,43,50,18,28,73
 464 VDU23,232,255,140,28,22,55,237,157
,8
 465 VDU23,233,0,0,0,10,50,18,28,8
 466 VDU23,234,60,12,28,22,54,40,0,0
 467 VDU23,235,0,0,0,0,0,16,28,8
 468 VDU23,236,24,12,24,20,0,0,0,0
 471 VDU23,237,76,82,82,50,28,16,56,16
 472 VDU23,238,56,16,16,112,152,148,149
,98
 473 VDU23,239,126,255,189,255,231,231,
255,231
 474 VDU23,243,231,231,231,255,255,189,
255,126
 475 VDU23,244,240,208,247,245,103,103,
242,247
 476 VDU23,245,247,247,247,247,247,247,
247,0
 477 VDU23,246,16,16,24,28,12,118,118,6
 478 VDU23,247,246,246,6,246,246,4,112,
112
 571 b$=K$+CHR$2+CHR$229+D$+CHR$230
 572 d$(0)=K$+CHR$2+CHR$231+D$+CHR$232
 573 d$(1)=K$+CHR$2+CHR$233+D$+CHR$234
 574 d$(2)=K$+CHR$2+CHR$235+D$+CHR$236
 575 o$(1)=K$+CHR$1+CHR$237+D$+CHR$238
 576 o$(2)=K$+CHR$2+CHR$239+D$+CHR$243
 577 o$(3)=K$+CHR$2+CHR$244+D$+CHR$245
 578 o$(4)=K$+CHR$1+CHR$246+D$+CHR$247
 580 W%=4:lw%=W%:S%=0
 601 e%=10
 915 stpI=0
1122 P2%=?(65800+(CX%+x%)*16)+((Y%+y%)*
320))
1130 IFP%<>0ORP2%>0PROChit:IFh%=0ENDPRO
C
1242 u%=?(65800+((U%(z%)+D%(R%))*16)+((
V%(z%)+E%(R%))*320))
1245 w%=POINT(p%,q%)
1250 IFw%<>0PROCbadhit:IFbh%=0z%=(z%+1)
MOD(W%):ENDPROC
1260 IFRND(e%)=1WP$=b$ELSEWP$=B$
1262 PRINTTAB(U%(z%),V%(z%))WP$
1453 FORI%=2TOno%
1454 IFP2%=ha%(I%)h%=I%
1455 NEXT
1460
1470
1480
1520 IFh%=1ANDL%>0GOSUB1850:PROCdie:IFL
%>0PROChs
1532 IFh%=3GOSUB1850:PROCdie:IFL%>0PROC
hs
1533 IFh%=4SOUND3,-13,0,1:PROCscore(RND
(1200)*5)
1534 IFh%=5SOUND3,-13,90,1:stpI=1
1535 IFh%=7PROCuxb
1590 IFbh%=2SOUND2,-15,230,1:GOSUB1840:
PRINTTAB(f%,g%)C$
1595 IFbh%=3SOUND2,-15,199,1:GOSUB1840:
PRINTTAB(f%,g%)b$
1596 IFbh%=6ANDW%<12lw%=W%:W%=W%+2:FORI
%=lw%TOW%-1:GOSUB1840:U%(I%)=f%:V%(I%)=g
%:PRINTTAB(U%(I%),V%(I%))H$:NEXT
1650 IFU%(z%)+D%(R%)=X%ANDV%(z%)+E%(R%)
=Y%bh%=1:ENDPROC
1660
1670
1680
1682 FORI%=2TOno%
1683 IFu%=ha%(I%)bh%=I%
1684 NEXT
1785 W%=4
1850 L%=L%-1:COLOUR128:COLOUR2:PRINTTAB.
(2,2);L%:SOUND1,-12,90,1:RETURN
2000 REM *** DIE ***
2010 DEFPROCdie
2020 FORI%=0TO2
2030 PRINTTAB(X%,Y%)d$(I%)
2040 PROCdelay(5)
2050 NEXT
2060 PRINTTAB(X%,Y%)B$
2070 ENDPROC
3000 REM *** RND ***
3010 DEFPROCrnd
3020 GOSUB1840
3025 Q%=RND(ob%)
3030 PRINTTAB(f%,g%)o$(Q%)
3040 ENDPROC
4000 REM *** UXB ***
4010 DEFPROCuxb
4030 mem%=&5F90:am%=mem%
4040 FORJ%=6TO265STEP2
4050 FORI%=1TO18
4060 IF?mem%=64PRINTTAB(I%,J%)B$
4070 mem%=mem%+16
4090 NEXT
4100 am%=am%+640:mem%=am%
4120 NEXT
4130 ENDPROC
```

THE OBJECTS

	CLOCK	BOMB	BONUS	SWITCH	TWO	THUMBSup
Made from characters	227 and 228	229 and 230	237 and 238	239 and 243	244 and 245	246 and 247
You	Collect them	Die on contact	Get bonus	Turn off baddies	Erase them	Remove bombs
Baddies	Move them	Move them	Erase them	Erase them	Clone two more	Erase them

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This is the BBC version – other versions will vary

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Your own logo disc or tape for £1!

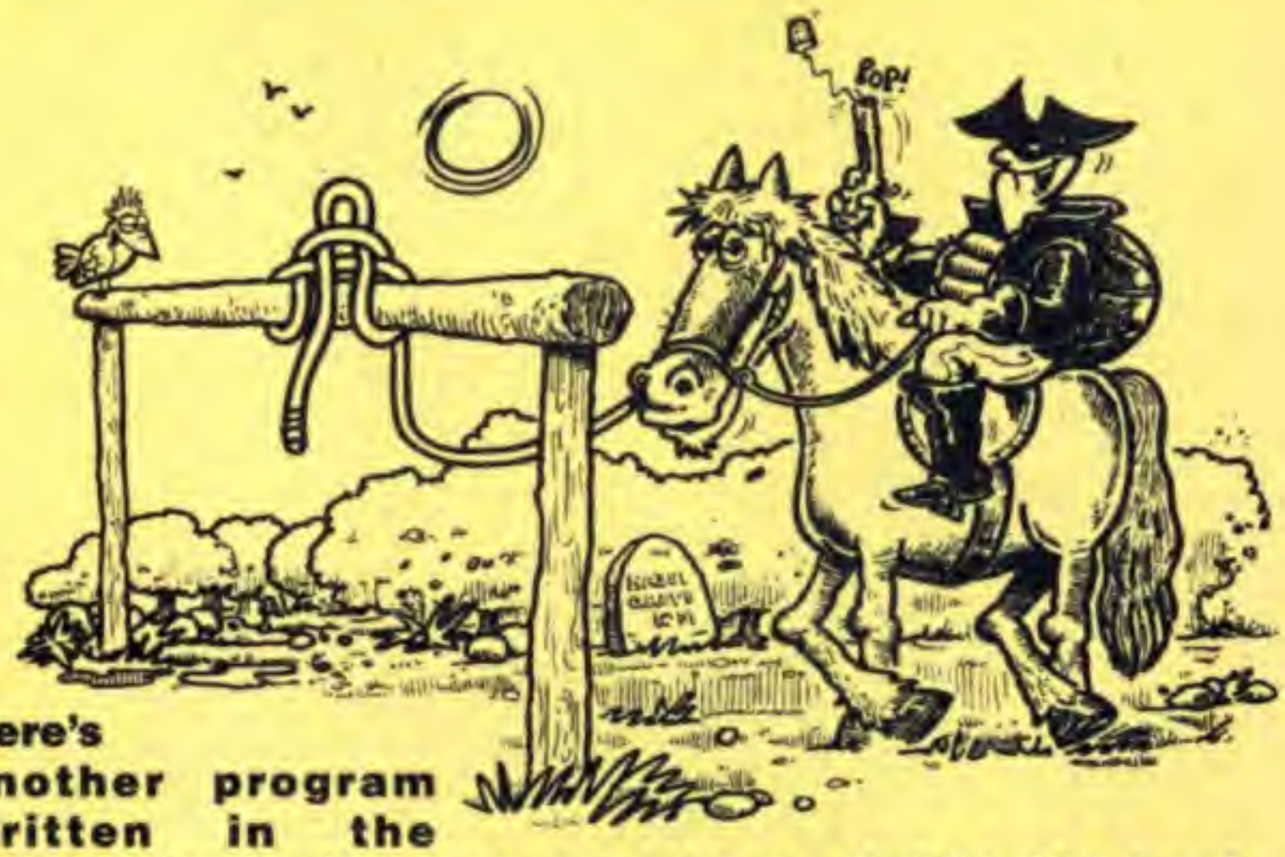
KNOT LOGO?

Turtle graphics is a vital part of any Logo program. And that's what Turtle Logo is. Specially written for the Electron, BBC Micro and Archimedes series, it is on the tape or disc that comes with the Let's Compute! Club bumper pack.

You can find out how to join the Club on Page 32 – and about all the other goodies you can get with it.

However, if you only want Turtle Logo we'll send it to you for just £1 if you complete and return the coupon below

Oh yes it is!



Here's another program written in the turtle's favourite language, Logo. Unlike the knot patterns in previous issues of *Let's Compute!* this one draws a REAL knot.

It creates a Highwayman's Hitch. That's the kind of knot used for tying up horses or boats.

It was sent in by Neil Melville (10) of Maidstone, Kent. Uses only very simple commands.

But it shows how, with just one or two of the Logo instructions and a bit of patience you can create real diagrams.

To try this program out yourself you first need to run the Logo Language.

If you haven't got it and you're using an Acorn computer the *Let's Compute!* Turtle Logo is an ideal starting point – see the offer on the left.

Then just type in the instructions and watch the knot draw move by move. If you already know how to define procedures you can put all the instructions in one. Then you can call it every time you want to draw the knot.

If you don't know how to define procedures, keep reading Logo Lowdown. You soon will.

If you can draw a knot – or anything else – in Logo let us see it. Send us a listing if you have a printer and also send us the program on tape or disc. Also, let us know which version of Logo you used.

Send it to *Let's Compute!* Adlington Park, Macclesfield SK10 4NP. There's a super *Let's Compute!* baseball cap for the writer of every one we print.

```
LT 90
FD 550
BK 1100
PU
LT 90
FD 100
PD
RT 90
FD 1100
BK 500
LT 90
PU
FD 200
PD
RT 180
FD 240
PU
FD 30
PD
FD 20
RT 90
FD 200
RT 90
FD 20
PU
FD 20
PD
FD 70
LT 90
FD 20
LT 90
FD 20
PU
FD 100
PD
FD 20
RT 90
FD 20
RT 90
FD 20
RT 90
FD 20
RT 90
FD 20
LT 90
FD 40
RT 90
FD 30
PU
FD 20
PD
FD 150
PU
FD 20
PD
FD 30
RT 90
FD 60
LT 90
FD 20
LT 90
FD 20
LT 90
FD 40
RT 45
FD 80
RT 45
FD 30
LT 90
FD 5
PU
FD 15
PD
FD 200
RT 90
FD 125
RT 90
FD 200
PU
FD 20
PD
FD 200
```

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Please send me the *Let's Compute!* Turtle Logo. I enclose cheque, postal order or stamps the the value of £1.

(Only suitable for Electron, BBC Micro or Archimedes series.)

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.....

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- ☐ Cassette

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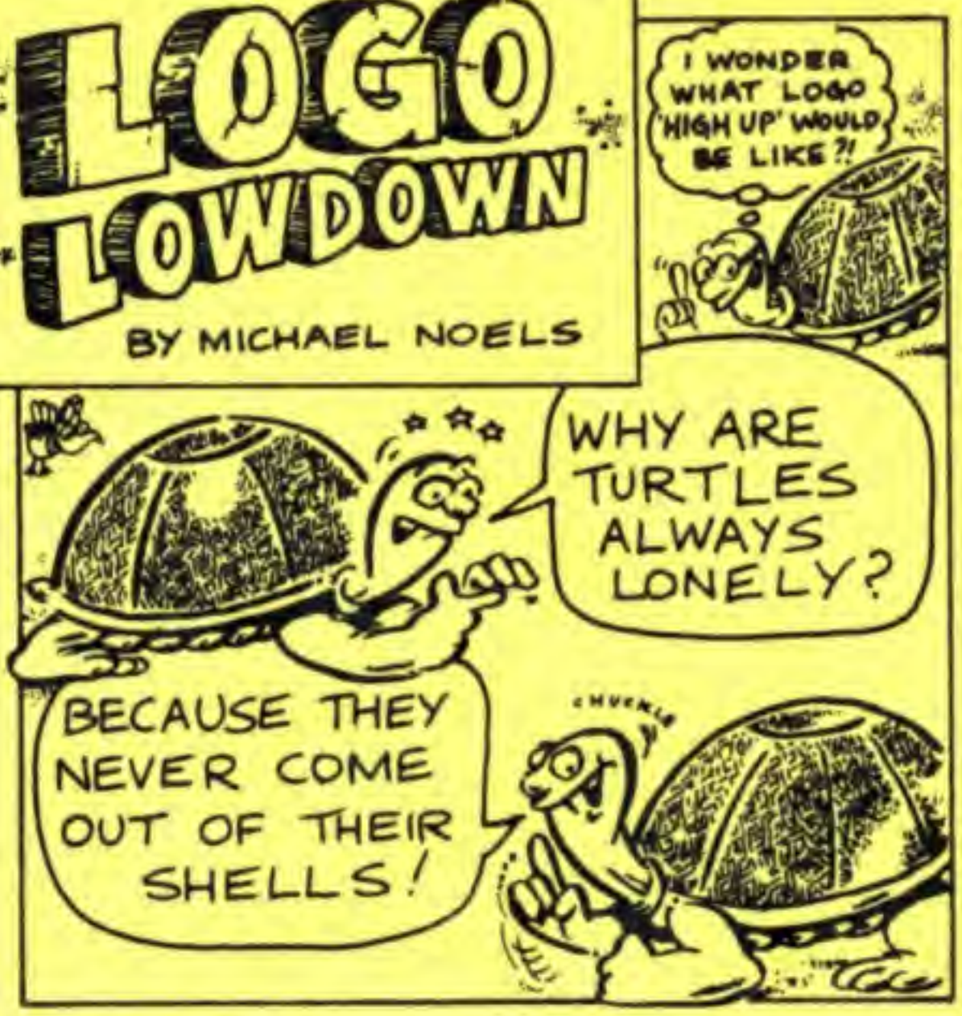
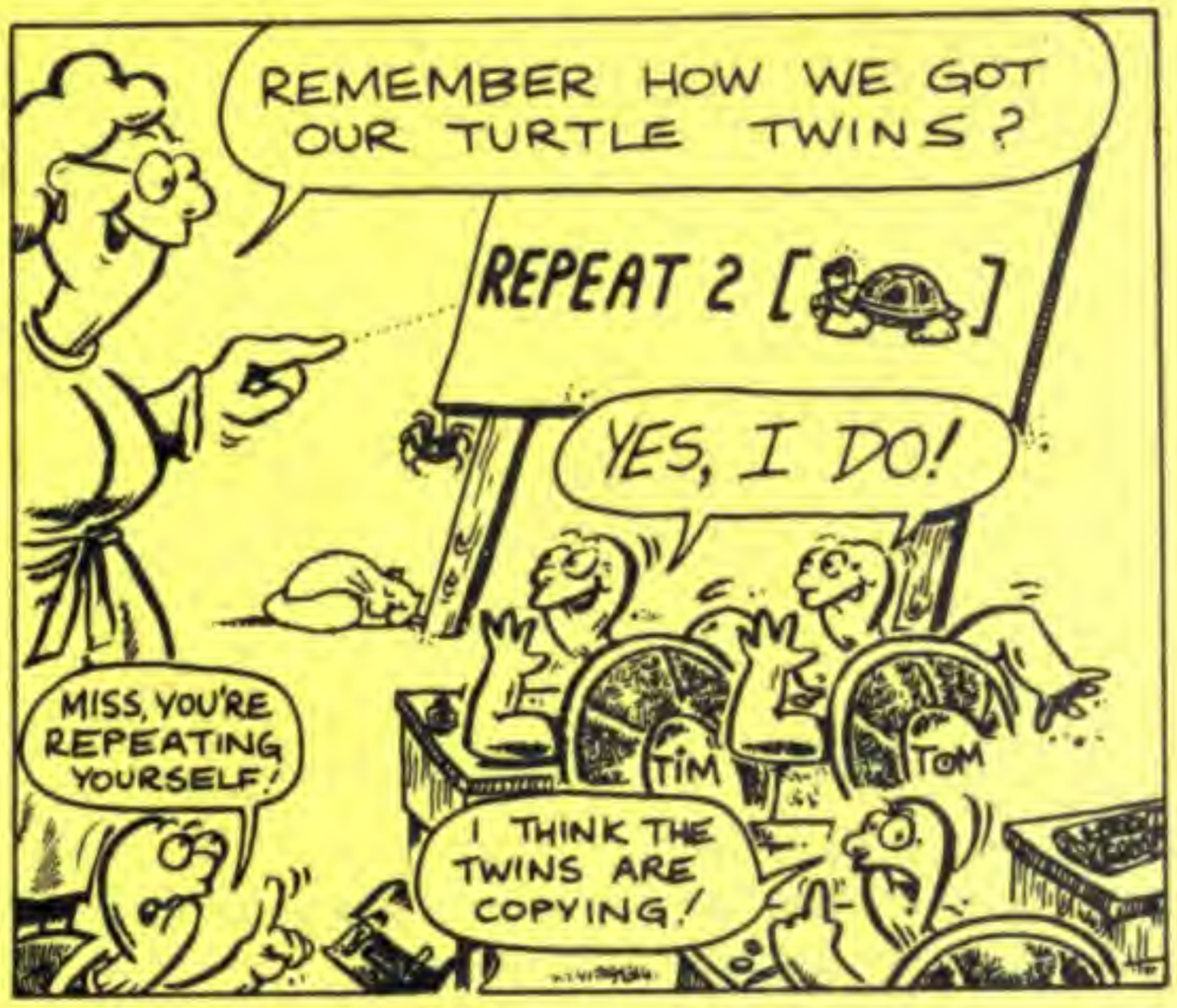
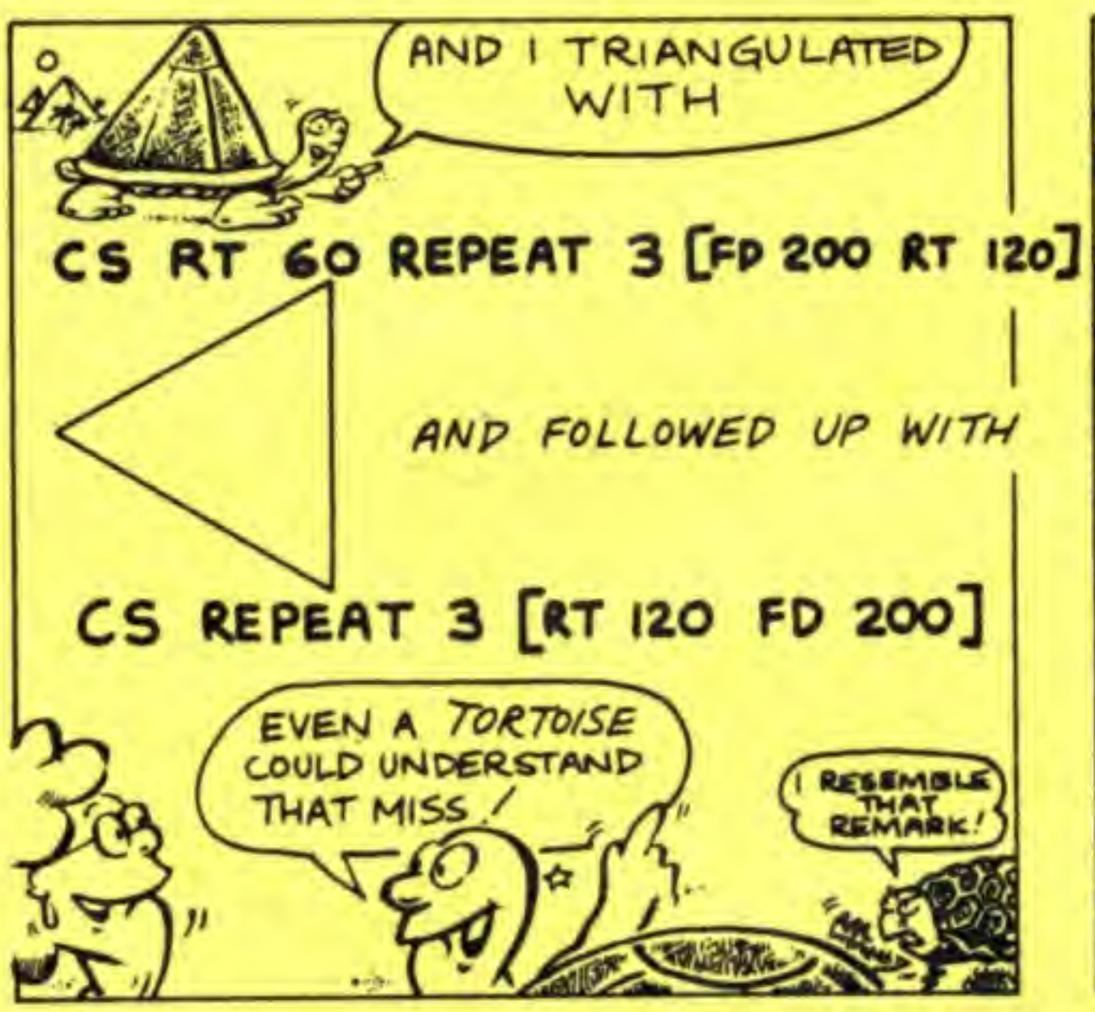
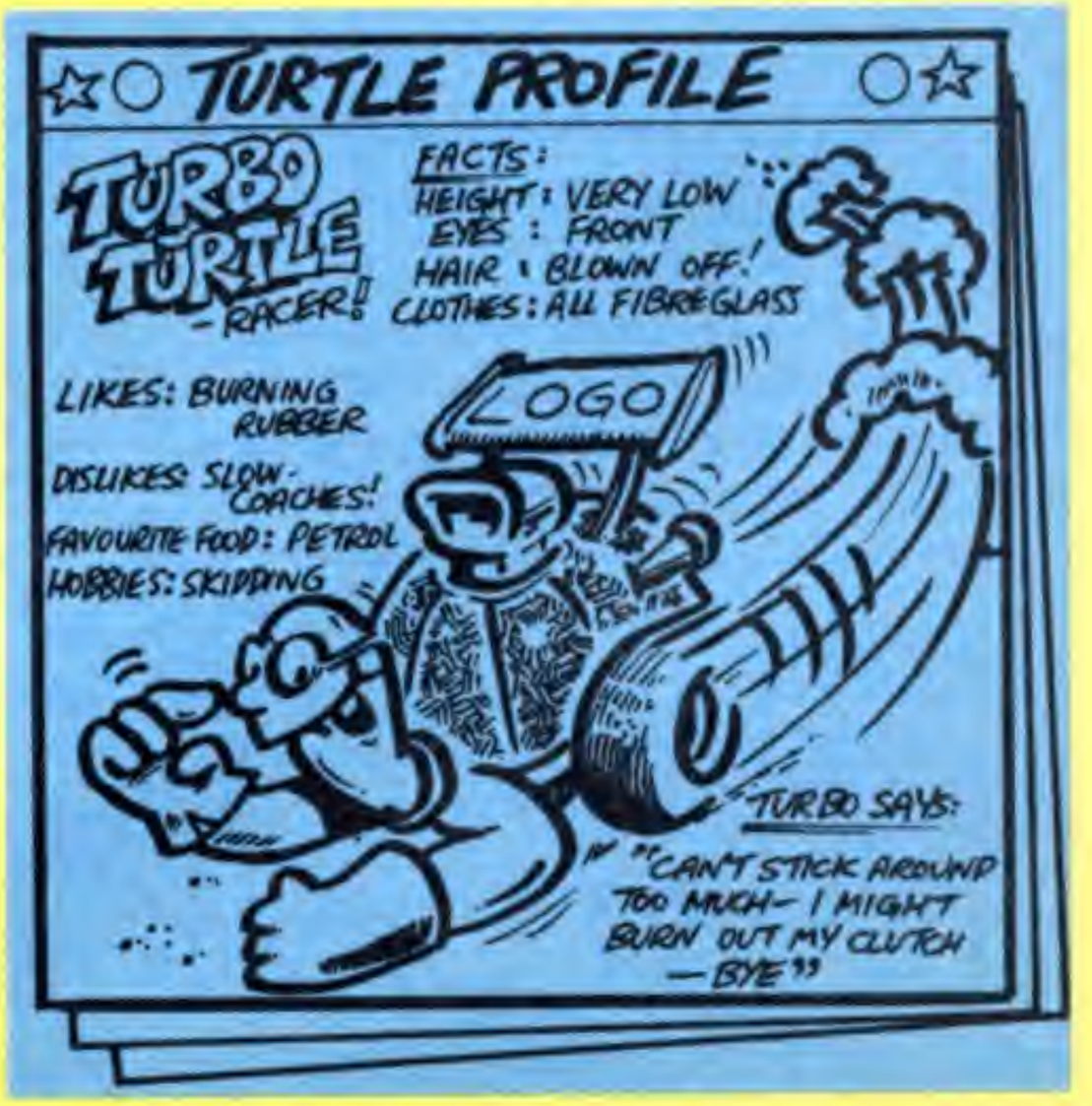
LOGO LOWDOWN

BY MICHAEL NOELS



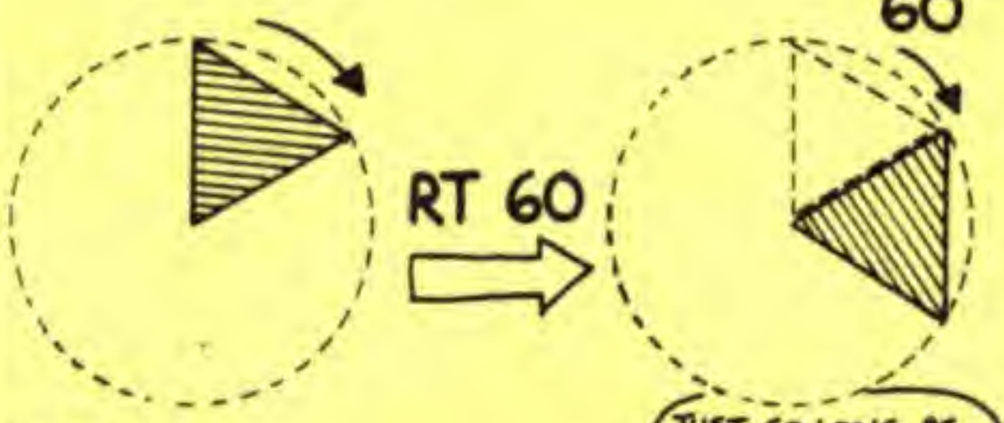






THE **RT 60** JUST TWISTS OUR TRIANGLE OVER BY A SIXTH OF A TURN

1/6 OF A TURN



ENTER

CS RT 60
REPEAT 3 [FD 200 RT 120]

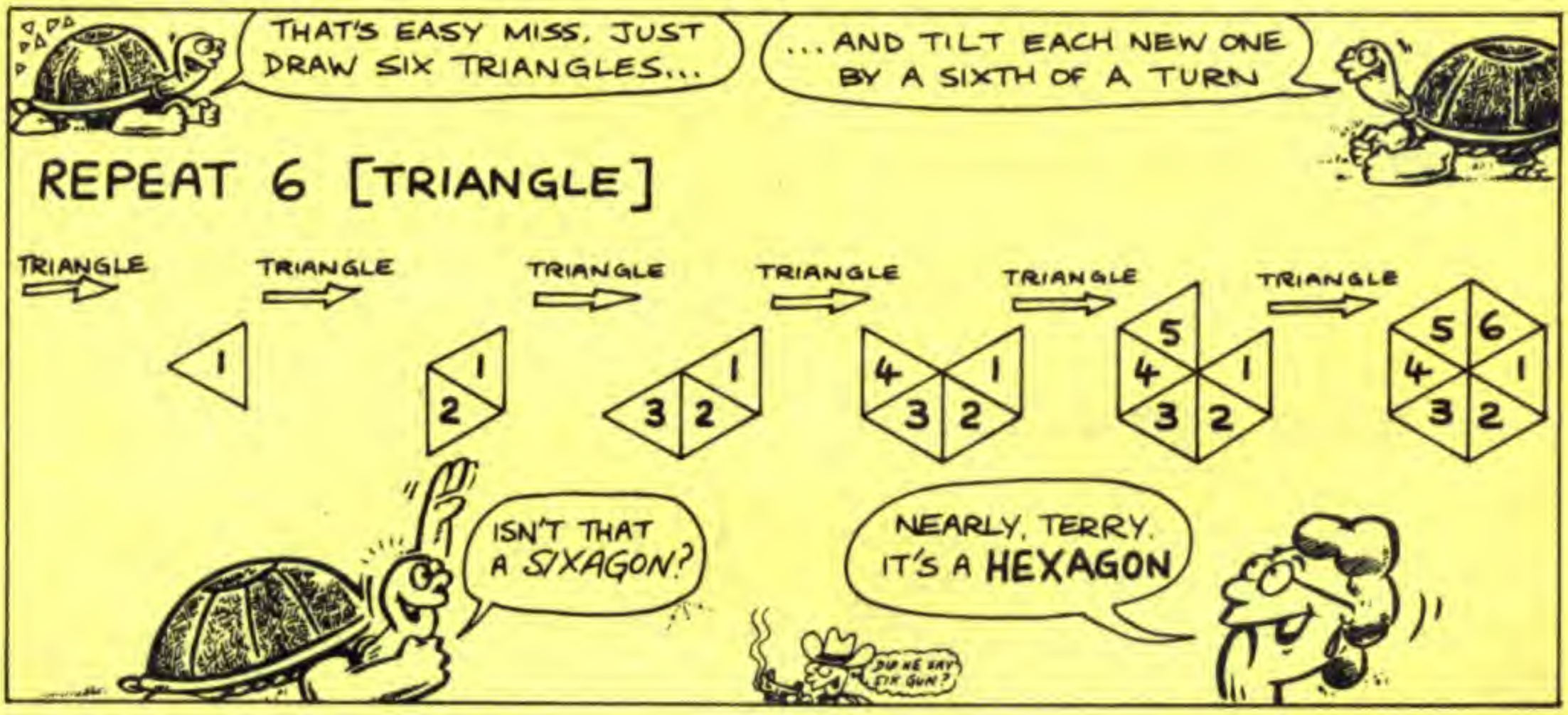
TO SEE THIS. **AND TRY TO NOTICE WHICH WAY THE TURTLE ENDS UP FACING**

REPEAT 6 [RT 60 REPEAT 3 [FD 200 RT 120]]

WELL, WE KNOW THAT RT 60 REPEAT 3 [FD 200 RT 120] GIVES US A TILTED TRIANGLE. LET'S WRITE **TRIANGLE** INSTEAD

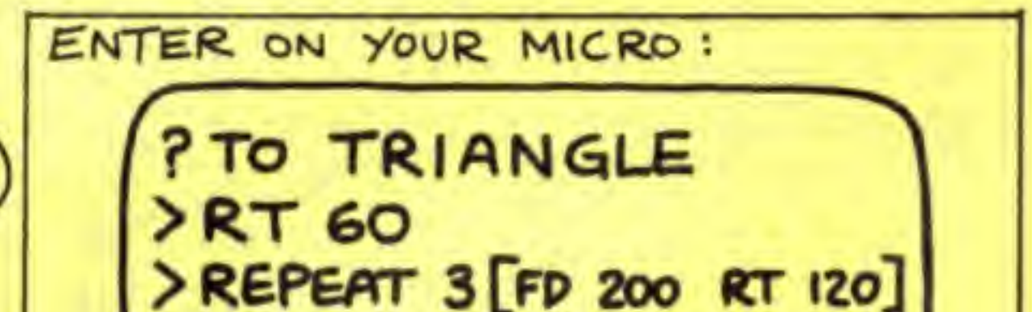
SO WHAT'S ON THE BOARD IS REALLY

REPEAT 6 [TRIANGLE]



ENTER ON YOUR MICRO:

```
? TO TRIANGLE
>RT 60
>REPEAT 3 [FD 200 RT 120]
>END
```



TO TRIANGLE: TEACHES THE TURTLE ORDER **TRIANGLE**

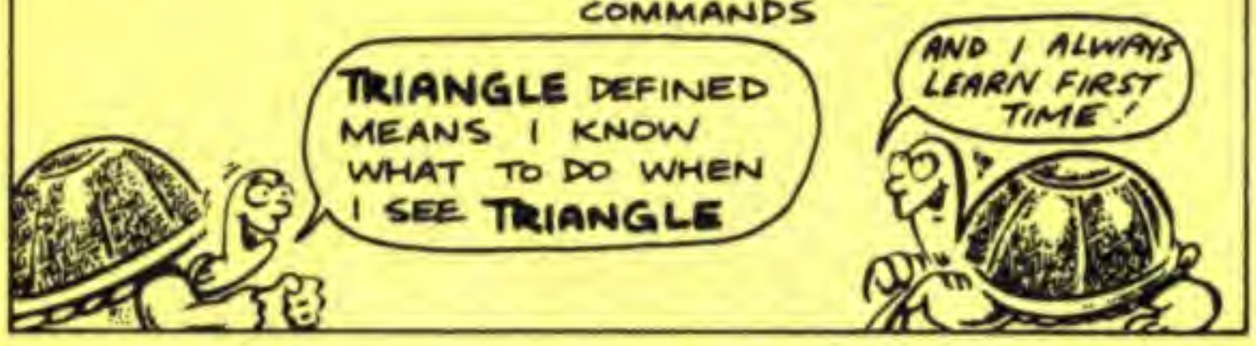
WHENEVER YOU GIVE THE ORDER OR COMMAND **TRIANGLE** THE TURTLE DOES WHAT YOU HAVE TAUGHT IT.

```
RT 60
REPEAT 3 [FD 200 RT 120]
```

THESE ARE THE COMMANDS YOU WANT THE TURTLE TO DO WHEN IT SEES THE TURTLE ORDER **TRIANGLE**

```
END
```

: THIS TELLS THE TURTLE THAT'S THE *END* OF THIS SERIES OF COMMANDS



PROVE THE TURTLE DOES WHAT IT'S TOLD BY ENTERING:

CS TRIANGLE

THEN ENTER:

TRIANGLE

AND AGAIN:

TRIANGLE

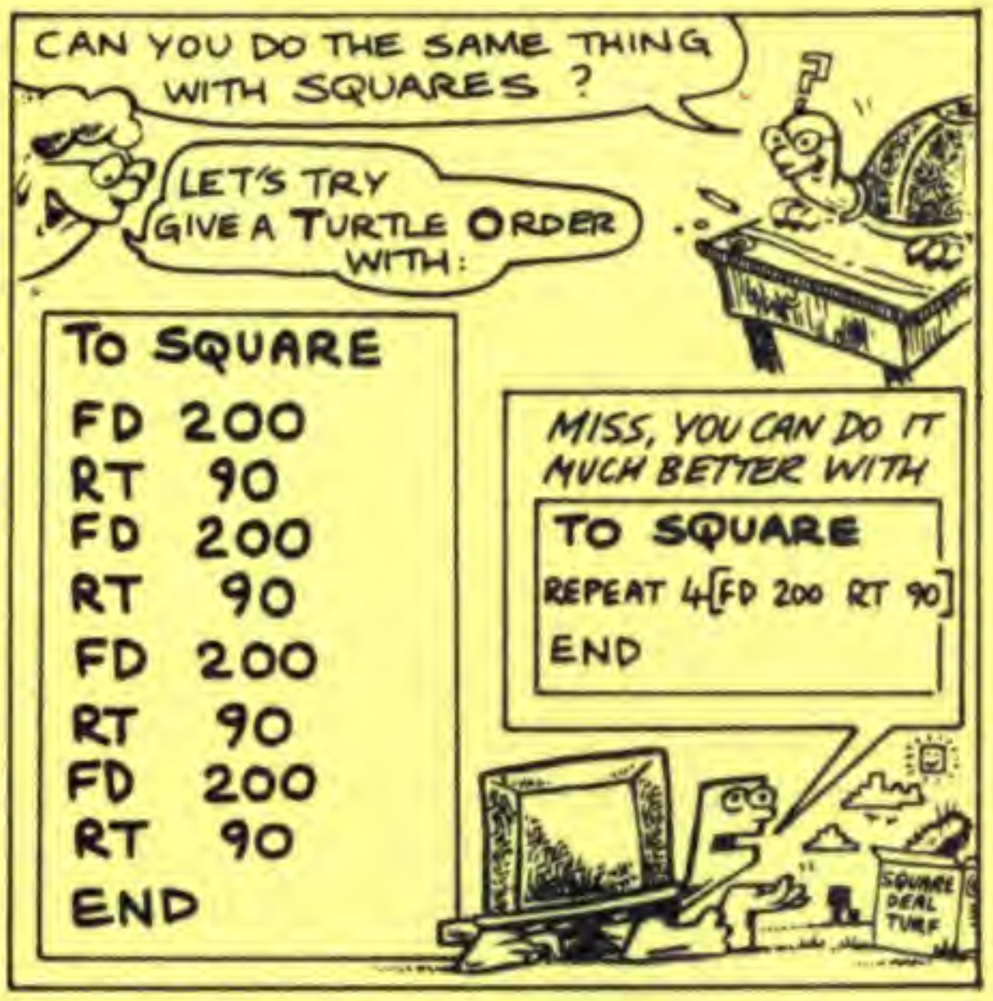
AND ANOTHER:

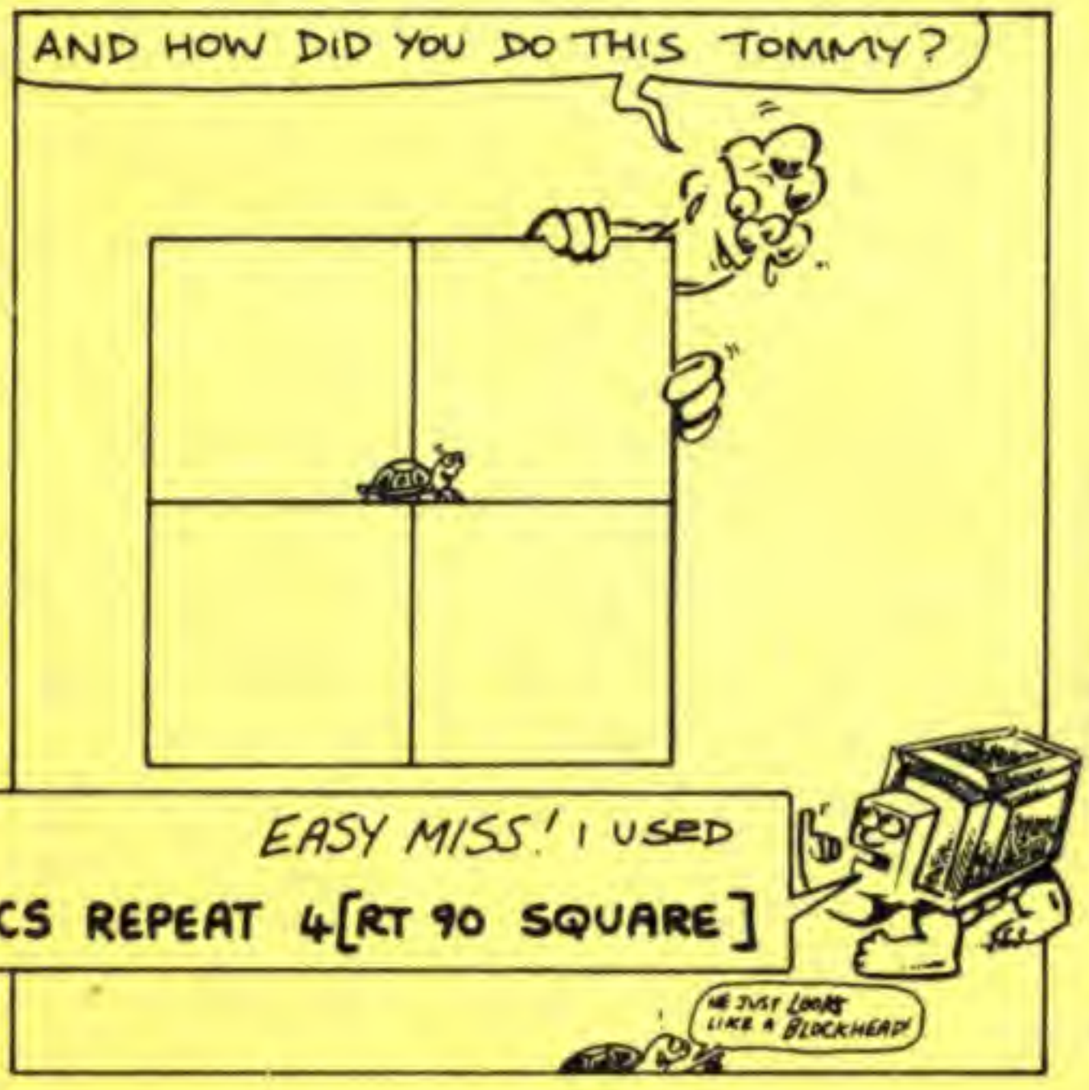
TRIANGLE

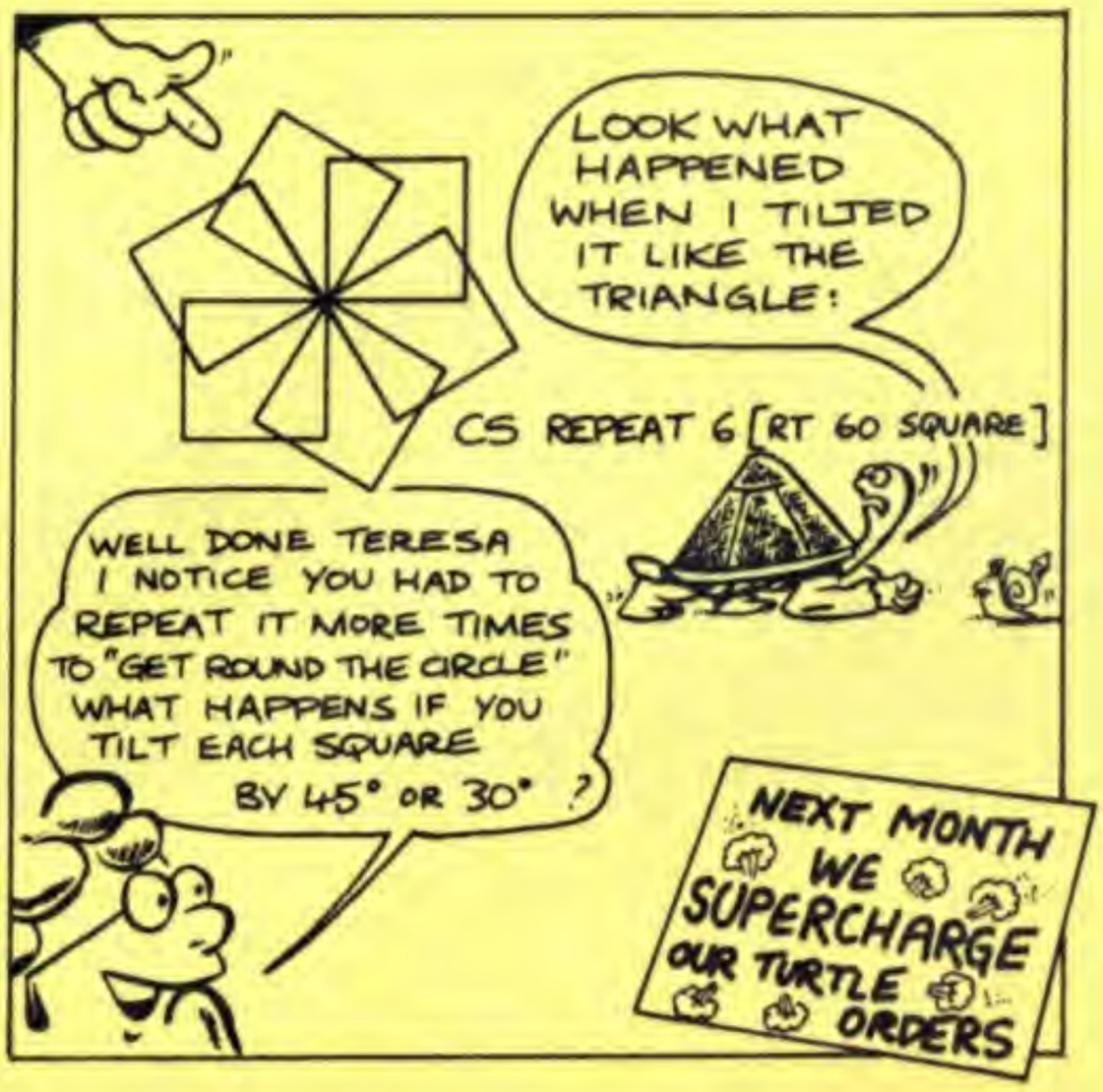
SEE WHAT'S HAPPENING?

NOW TRY:

CS REPEAT 6 [TRIANGLE]



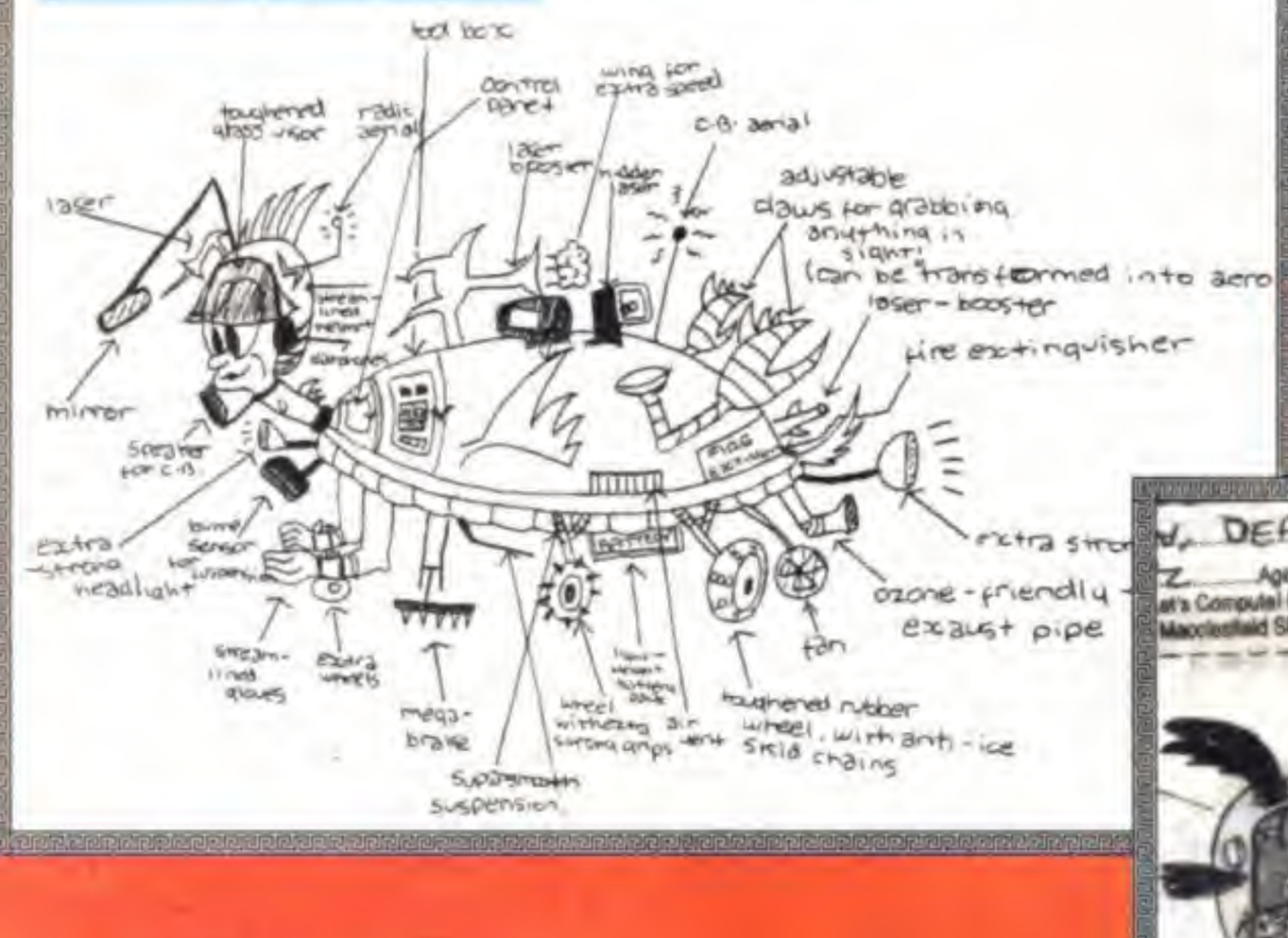




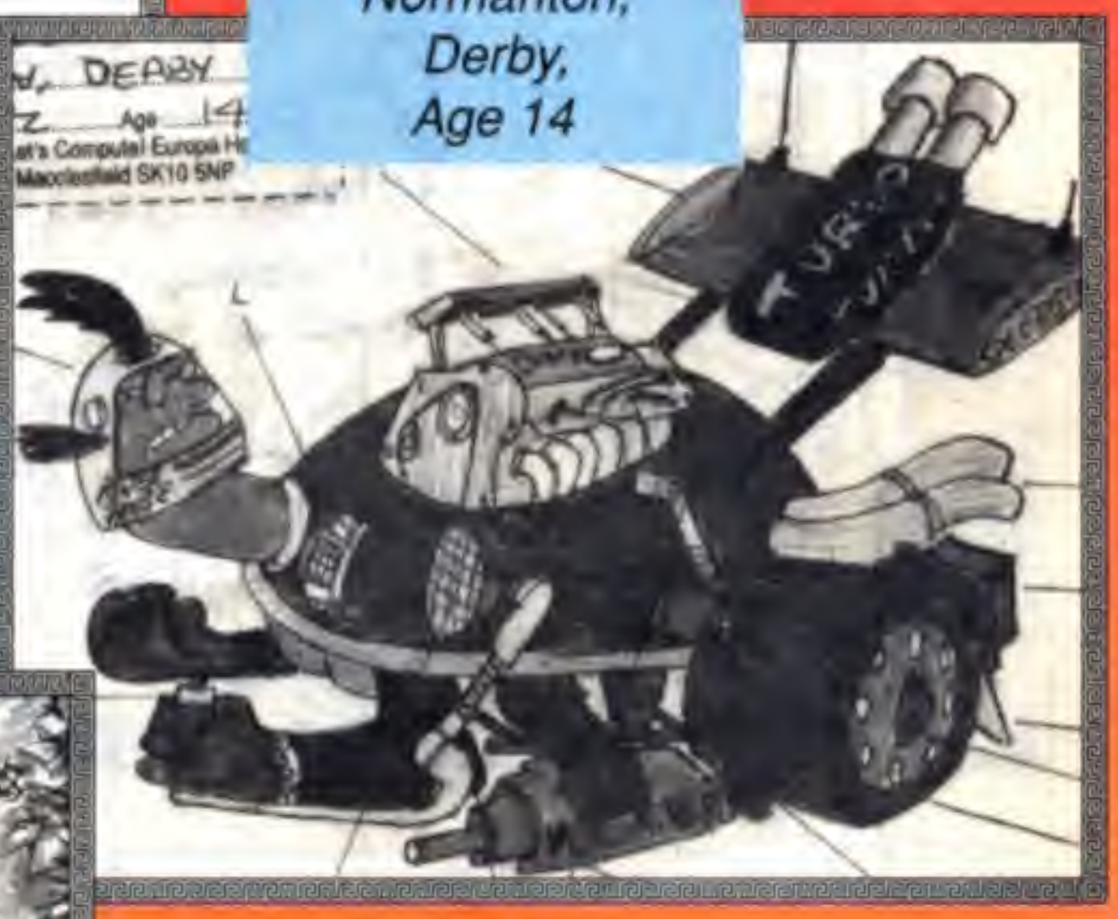
Results of Mike Goldberg's

Carl Wilson,
Winchester, Hants.
Age 14

Rowena Shuttleworth,
Ravenshead,
Nottinghamshire
Age12

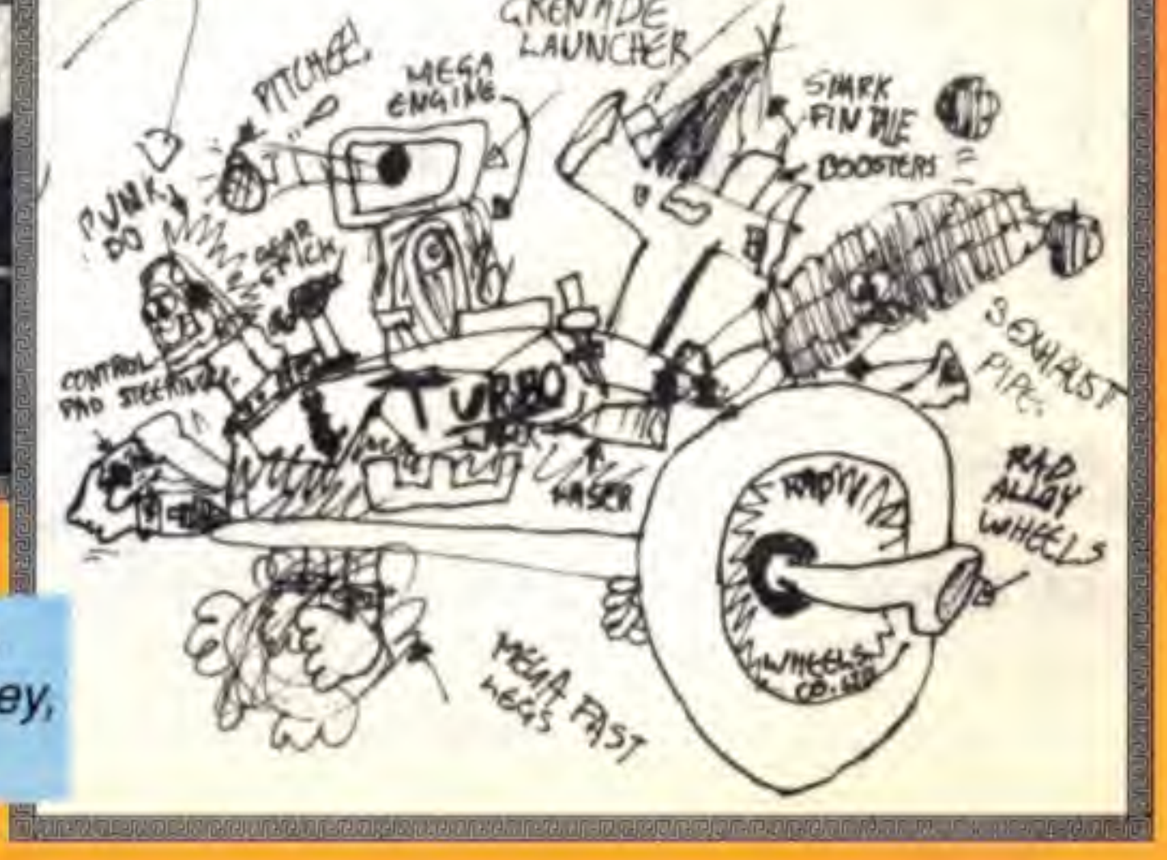


Dalwinder Dhanjal,
Normanton,
Derby,
Age 14



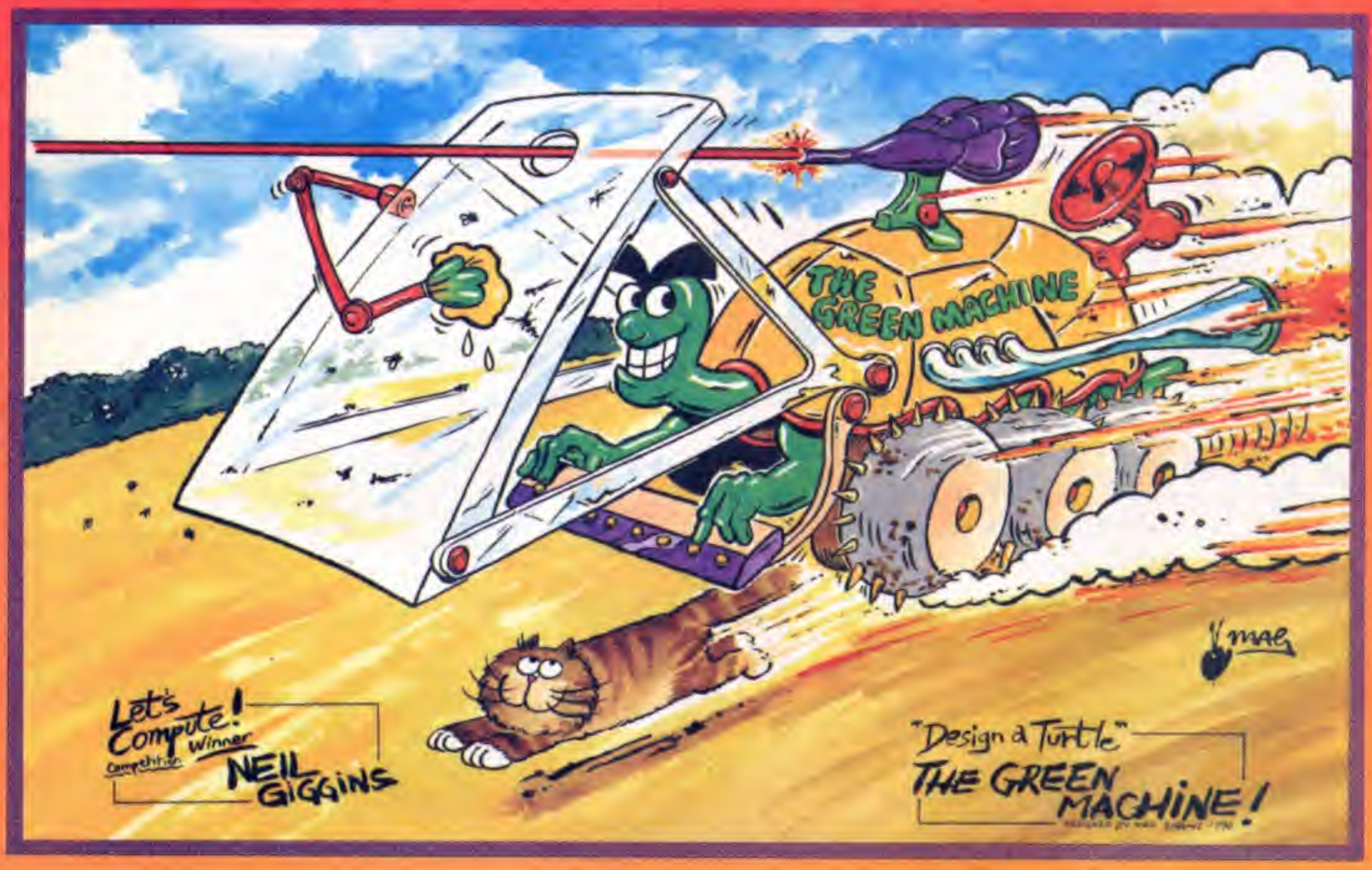
John Madden,
Dublin, Ireland,
Age 12

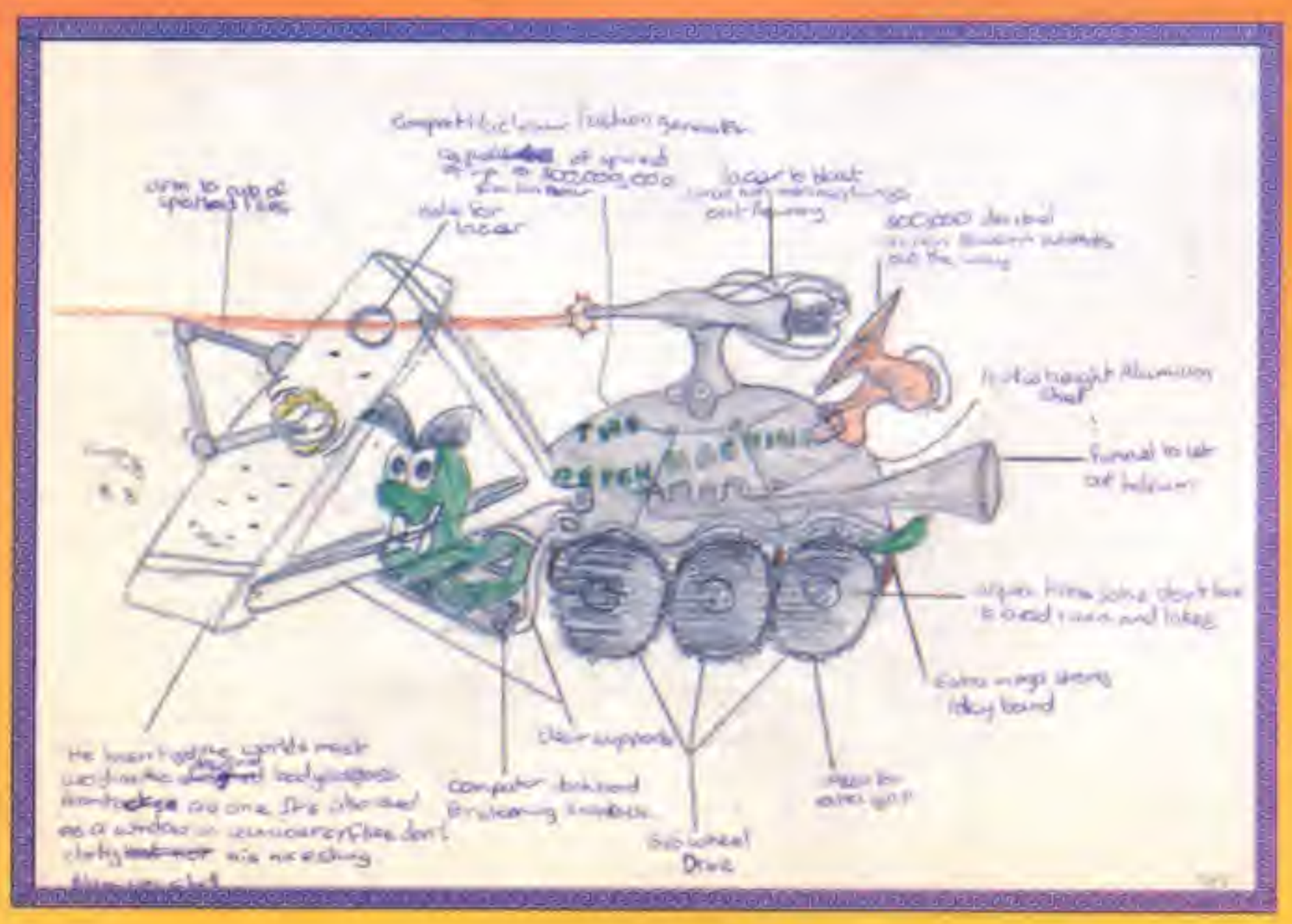
Mark Evans,
St. Helier, Jersey,
Age 7



'Design a Turtle' Challenge

THE WINNER!





The turtle invasion has ended! Over the last couple of months the *Let's Compute!* office has been flooded out with the creatures – all because ace artist Mike Goldberg challenged you to design a Supa Turbo Turtle.

● Pictured left is the winner – a magnificent effort from Neil Giggins (13) from Towcester, Northants. Mike's worked his magic on Neil's design and produced the stunning painting above. It will be given a fab frame before being handed over to Neil.

● Among its many features are a 300,000 decibel siren to warn animals out of the way, an arm to rub off splatted flies and a laser to blast non-moving objects to smithereens. This six wheel drive creature with spiked tyres has been designed to reach incredibly high speeds.

● The five runners-up whose turtles are pictured opposite will each receive *Let's Compute!* baseball caps.

There's another Mike Goldberg challenge on Page 43!

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Leave £10 in a piggy bank and a year later you'll still have £10. But put it in a bank account and in the same time it could have grown by an extra 70p.

Pennies from Heaven

This program teaches your computer how to work out your bank interest.

And shows you how that nestegg will grow and grow.

How much you can make depends on two things: The present interest rate – which can change at any time. And how long you leave your money in the bank.

To find out how much interest you're earning just answer the simple questions your computer will ask you. Have your bank book in front of you. You'll need to tell the computer about each time you put money in or took some out.

First you'll be asked to give the date you did this. Type it in as three numbers, separated by commas.

So, November 5 this year would be entered as:

5,11,90

Then you need to say how much you put in or took out. If you took money out, put a minus (-) in front of the number you type in.

Next, tell the program what the interest rate was at the time. You're then asked if you want to enter any more. You can reply Y or N.

If you answer Y you'll get the same questions again. Like this, you can make as many entries as are in your bank book. If you answer N you'll be asked for today's date.

Once you've typed this in, you'll be told what interest you're now due.

```
  10 REM Interest
  20 REM by Ken Hughes
  30 REM (c)Let's Compute!
  40 DIM D(100)
  50 DIM M(100)
  60 DIM Y(100)
  70 DIM C(100)
  80 DIM R(100)
  90 CLS
 100 LET N=0
 110 LET N=N+1
 120 INPUT "What is the entry date (d,m
,y)";D(N),M(N),Y(N)
 130 INPUT"How much";C(N)
 140 INPUT "What interest rate";R(N)
 150 LET R(N)=R(N)/100/365
 160 INPUT"Do you want to enter more (Y
/N)";A$
 170 IF A$="y" OR A$="Y" THEN GOTO 110
 180 IF A$<>"n" AND A$<>"N" THEN GOTO 1
60
 190 IF Y(1)<100 THEN Y(1)=Y(1)+1900
 200 LET N=N+1
 210 INPUT"Enter today's date: d,m,y ";
D(N),M(N),Y(N)
 220 LET TBAL=0
 230 FOR M = 2 TO N
 240 IF Y(M)<100 THEN Y(M)=Y(M)+1900
 250 LET T1=D(M-1)+(M(M-1)*30.5)+(Y(M-1
)*12*30.5)
 260 LET T2=D(M)+(M(M)*30.5)+(Y(M)*12*3
0.5)
 270 TEMPDATE=T2-T1
 280 LET TBAL=TBAL+C(M-1)
 290 LET TBAL=TBAL+(TBAL*R(M-1)*TEMPDAT
E)
 300 NEXT M
 310 LET TBAL=INT(TBAL*100)
 320 LET TBAL=TBAL/100
 330 PRINT:PRINT"You now have: ";TBAL
```

Averaging it out

To keep the listing short we've told your computer each month has 30.5 days rather than 28, 29, 30 or 31. This means that the results are not quite accurate – but not that far out.

IS YOUR COMPUTER HERE

C64/128: Change line 90 to:

```
90 PRINT CHR$(147)
```

ST (Stos) Amiga (Amos): Put # after all the variable names that don't end in $. So D(100) becomes D#(100), TBAL becomes TBAL# and so on.

THE LISTING WORKS AS IT IS ON OTHER MICROS

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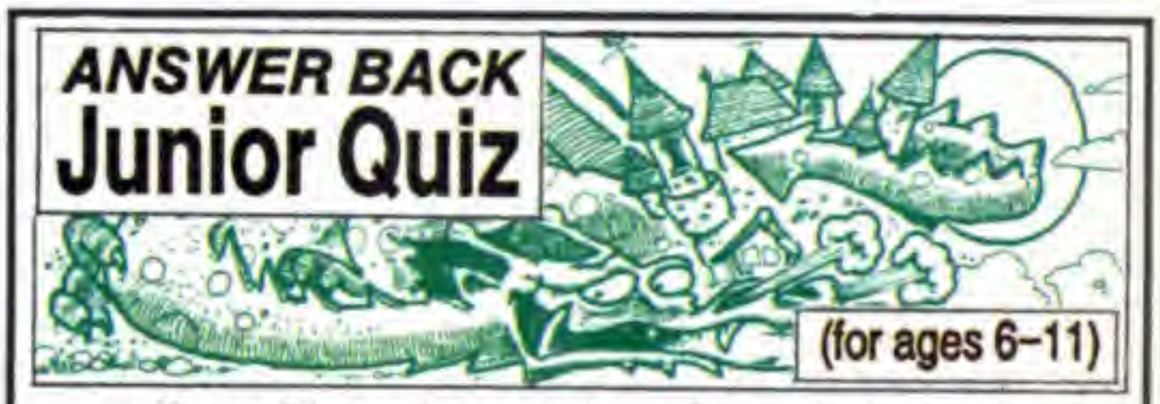
Junior Quiz



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The Mike Goldberg challenge!

Can YOU spot the difference?

How to enter

Study these two pictures. There are not exactly the same. On the right-hand picture circle all the differences you can spot.

When you've found them all – and don't stop at 10! – fill in the entry form below. Then just cut out (or photocopy) this page and send it in before October 31.

Win

. . . this unique, hand – painted jigsaw. It was specially made by cartoonist Mike Goldberg, the creator of Rom and Ram, and will be personalised with the winner's name.

ENTRY FORM

I spotted _____ differences!

Name _____

Address _____

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Postcode _____ Age _____

My computer is: _____

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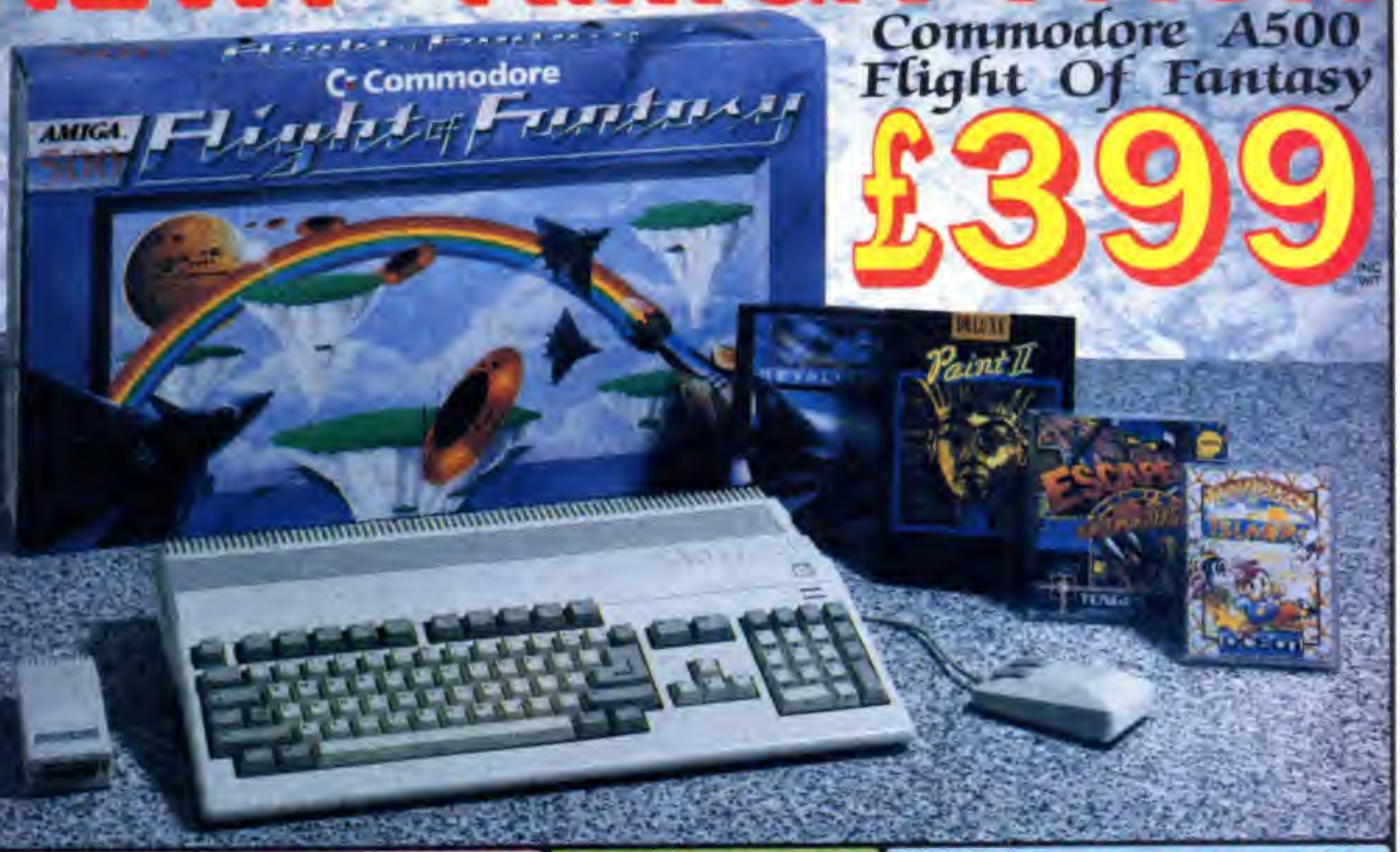

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